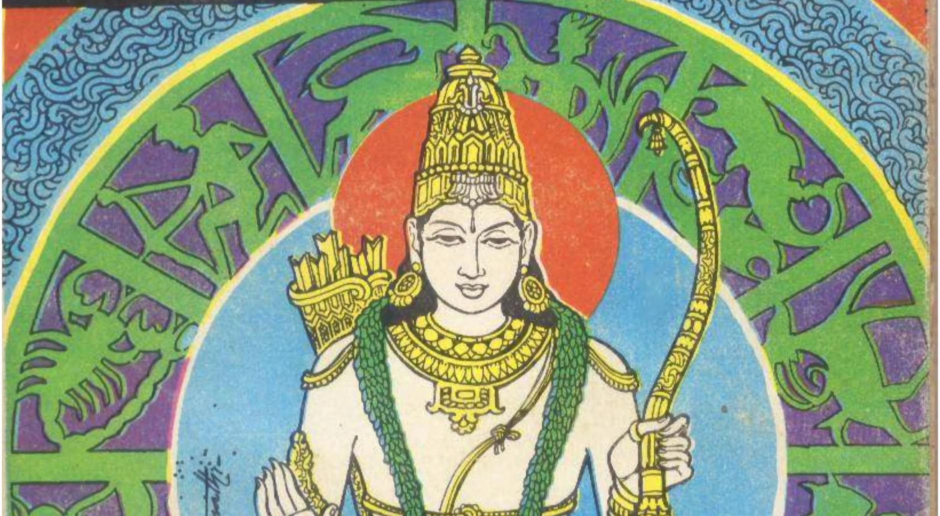
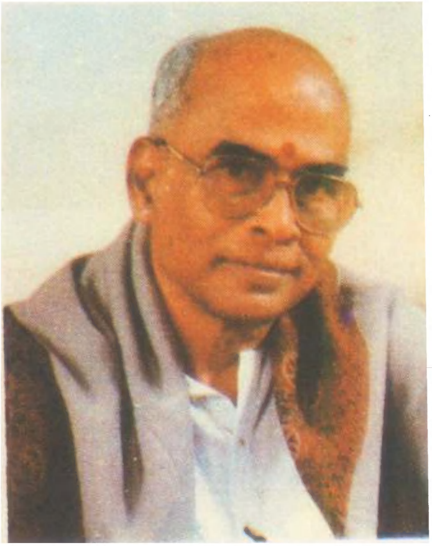
DATE OF SRI RAMA

N. NARASINGA RAO



GENERAL EDITOR
DR. N. MAHALINGAM

THE GENERAL EDITOR



Dr. N. Mahalingam is an eminent industrialist, educationist, technologist, planner and philanthropist of India. He is an innovative industrialist hailing from a family of traditional agriculturists and has been a pioneer in establishing agro-industries. In the realm of Sugar, Textiles, Tea and Transport his contribution to the economic development of the State of Tamil Nadu, Kerala and Karnataka is significant. A number and variety of firms were founded by him which include sugar plants, textiles, distillery, chemical units, cargo movement and synthetic gem manufacturing plant, to name a few.

Dr. Mahalingam's services in the cause of education attest to his abiding interest in making educational opportunity available to a large number of people, especially from the weaker sections. He has established the Nachimuthu Polytechnic and N.G.M.College at Pollachi to provide an educational environment conducive to the overall development of the youth. The Kumaraguru College of Technology, Sakthi Institute of Technology, Santhalinga Adigalar Tamil College, Palaniammal Higher Secondary School and Kuppanda Gounder School and a host of other Institutions owe their origin, growth and sustenance to his leadership, guidance and benevolence.

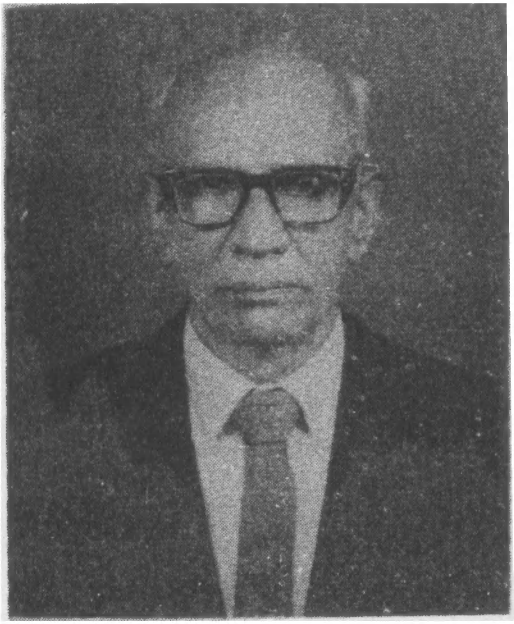
Dr. Mahalingam has been a life member of the Senate of the University of Madras and has served on the Syndicates of Madras and Anna Universities.

As a legislator and planner, Dr. Mahalingam has made significant contributions to national endeavour. As a member of the Madras Legislative Assembly from 1952 to 1967 he played a key role in bringing about a number of development projects. He has served on the Board of Directors of several public sector undertakings such as Neyveli Lignite Corporation, Cochin Shipyard Co.Ltd., Housing and Urban Development Corporation (HUDCO), Madras Metropolitan Water Supply and Sewerage Board, State Industries Promotion Corporation of Tamil Nadu (SIPCOT), Tamil Nadu Industrial Investment Corporation Ltd., (TIIC) and others. He has served as Chairman of the Madras Fertilizers Ltd. He was a member of the Tamil Nadu Planning Commission during 1971-74 to draw perspective plans for industrialising the State. The Government reappointed him as a member in 1981.

Dr. Mahalingam is the author of a number of books. He is a philanthropist and an ardent devotee of Saint Ramalinga Vallalar. The Sakthi Foundation, established by him, strives to remove unemployment and hunger from its environs and bears testimony to his humane spirit.

Dr. Mahalingam is a fellow of the Institution of Engineers (India). The Bharathiar University has conferred on him the Degree of Doctor of Laws; the Anna University has awarded the Degree of Doctor of Science. He has recently been conferred the Indira Gandhi National Integration Award and the Hony. Consulship of Mauritius.

ABOUT THE AUTHOR



Mr. N. Narasinga Rao is an Engineer by profession. After completing his technical studies in Electrical Engineering in 1939, he had served the private sector as well as the Madras Government for over a decade.

In 1955, he joined the Neyveli Lignite Corporation Limited, and after a service of over two decades, retired in 1975. He is a practising electrical consultant since then. He has travelled throughout the country. As a faculty member, he has taken part in over fifty seminars sponsored by NIRCON. He is a specialist in conservation of energy. He has also travelled extensively in U.K., West Germany, France and a few continental countries.

He is a linguist, speaking over eight languages. He loves sports and is a tennis player. In his boyhood, he had fretwork as his hobby and in his youthful days, he switched over to photography.

After his retirement, he developed the study and research on Valmiki Ramayana. He has made a systematic analytical study of the epic and has thrown new light on facts which have so far not been referred to by others. He has proceeded step by step and fixed the Date of Birth of Sri Rama, all the time adhering to data provided in the epic. He has fixed the date as 11th February 4433 B.C.

ABOUT THIS BOOK

The Date of Sri Rama has been and continues to be under discussion. Various thinkers have given various dates. The present finding of Mr.N.Narasinga Rao is one more attempt. He follows the principle that the internal evidences made available by Valmiki in his epic are the only basic material for consideration. This is the strong foundation on which the author builds the super structure of his investigation.

Slokas 8,9 and 10 of Sarga 18 of the Balakanda of Valmiki Ramayana form the basic raw material for his research. These have been analysed from different angles and interpreted in a cohesive manner bringing out startling revelations. The conclusions he has arrived at relate to the birth time of Sri Rama; the balance part in Janma Lagna; Longitudes of Sun, Moon, Sukra and Sani; and the unspent part of the Guru Maha Dasa etc.

The search of the author for the possible years of birth of Sri Rama is comprehensive. It has extended over a wide range from 3500 B.C. As a result he has identified the year, the month and the date of birth. It is hoped that this effort will be treated by International Societies as a key reference data for connecting other events in their respective religion, countries etc.

DATE OF SRI RAMA

N. NARASINGA RAO

GENERAL EDITOR
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FOREWORD

The date of Sri Rama has been and continues to be under discussion. Various thinkers have given various dates. The present finding of Mr. N. Narasinga Rao is one more attempt.

*Prof. K. Srinivasaraghavan picked up the threads left loose by giant astronomers of international repute and pursued further to fix the date of birth of Sri Rama. He created a **new dimension** in the research of historic dates and developed **wonderful** methods of calculating the longitudes of planets for distant past periods and adopted them in fixing the date of birth of Sri Rama as 10th January 4439 B.C. Others in his team like Sri G.S. Sampath Iyengar, Sri G.S. Seshagiri etc., continued to do the unfinished work. Both of them are well-renowned disciples of Prof. K. Srinivasaraghavan and have contributed much to the astronomical knowledge, by way of writing several books, articles and all of them are well-received. Though they have all fixed the year of birth of Sri Rama as 4439 B.C., certain finer and confirmatory details that satisfy the sensitive principles and scientific requirements of the Hindu Astronomy, which was superior in the Treta Yuga than in the modern world, were found lacking.*

Mr. Narasinga Rao is a practising Electrical Engineer. Though he retired from active service over a decade ago, he has taken up research on Valmiki Ramayana. He has concluded that the date of birth of Sri Rama is 11th February 4433 B.C. The year is just short of the year fixed by Prof. K. Srinivasaraghavan by six years.

Mr. Narasinga Rao follows the principle that the internal evidences made available by Valmiki in his epic are the only basic material for consideration; this is the strong foundation on which the super structure of the investigation is built. The basic raw material for his research are the three slokas 8, 9 and 10 of sarga 18 of the Balakanda of Valmiki Ramayana. He has studied these slokas critically and in great depth, analysed them from different angles, interpreted them in a cohesive manner, brought out startling revelations and arrived at certain conclusions to give the end-results in a convincing manner. They relate to:

a. Birth time of Sri Rama,
b. Balance part in Janma Lagna,
c. Longitudes of Lagna, Sun, Moon, Kuja, Guru, Sukra and Sani
d. The unspent part of Guru Mahadasa etc.

Mr. Rao has successfully developed a Hi-Tech method to embrace all the strict dogmas of astronomy and astrology. They are:

a. Precession of equinoxes,
b. Sidereal and Tropical year,
c. Lunar system of reckoning titi, month, year, etc.
d. Luni-solar system,
e. Fixing the equivalent western calendar years for easy link of the Indian System.

His search for the possible years of birth is comprehensive. He has extended the search over a wide range from 3500 B.C. so as to ensure that there is no possibility of any omission. He has calculated the beginning of the solar new year day, lunar new year day, the titi on the 1st January of each year, sorted them out and has finally identified 4433 B.C. as the possible date of birth of Sri Rama.

Having fixed the year, Mr. Rao has proceeded to fix the month and date of birth; but he felt that this will carry conviction only when it is verified and found correct by the latest technique acceptable to all. He felt that nothing short of a direct calculation of the longitudes of these planets, as is being done now in this modern world with vast development & advancement in the technique of calculations, will be satisfactory. He is of the opinion that all disturbances that occur to the several planets due to several causes have to be taken into consideration. Hence he felt the urge to adopt modern formula. The most modern method is the one adopted by Nautical Almanac which enjoys reputation in the international community.

Mr. Rao adopted modern formulae and calculated the longitudes of the planets on the 11th February, 4433 B.C., and found that the results tally correct to the second with what was given by the great astronomer sage Valmiki to his posterity, as worked out by the author and given in the first chapter.

The first discovery of the date of Birth of Sri Rama as 11th February 4433 B.C., on the strength of the internal evidence made available by Valmiki in his epic, is from the Hindu religion. This has proved to be an important and solitary land-mark in ancient history since Valmiki Ramayana is the only pre-historic epic. Hence this book is bound to be received as a great boon by the inquisitive and impatient indologists, who have been starving all along for such authoritative data acceptable to the international community.

The International Society for the Investigation of Ancient Civilizations has been resolutely looking forward for the result of investigations into the date of the Ramayana. This institution, of which the undersigned is the Chairman, welcomes this effort and recommends to the International Societies to treat this as the key reference data for connecting other events in their respective religions, countries etc., as pre-Rama and post-Rama periods.

In this work the author has set at rest the controversy of the Ayanamsa. Even this day, the Ayanamsa has been defying a satisfactory solution. Different stalwarts of astronomy and astrology adopt different values because there was no known way of verifying their values. The longitudes of a few planets given by Valmiki as internal evidences in his epic, form important and weighty references in Nirayana. The longitudes in Sayana are calculated by a modern method. The difference between the above two, gives the value of Ayanamsa. This value tallies very well with the value calculated as per the "Surya Siddhanta" propounded by Sri L. Narayana Rao.

A Diary of Sri Rama has been prepared by the author purely on the internal evidences made available by Valmiki himself under his own authority. Nothing has been assumed by the author out of imagination or intellectual speculation. All such evidences have been sorted out and arranged in a chronological order. In this exercise, a vivid picture of Sri Rama, from his birth till his coronation as the King of Ayodhya, has emerged.

I hope this book will be warmly received by the academicians and scholars as well as the lay public.

Madras N. Mahalingam
June 1990.

INTRODUCTION

A SURPRISE, if not a wonder, it may be, to the reader that an electrical engineer by profession could venture to write a treatise on SRI RAMA'S JATAKA. It all happened this way. On a fine morning the parayana of Valmiki Ramayana was initiated to the writer by Sri Kalyanarama Battacharya, the principal sishya of late Sri Anantarama Dikshitar as part of the religious ritual. When the parayana from the Bala Kanda to the end of Yudha Kanda was repeated a few times, the writer was much attracted towards the treasure of knowledge of many disciplines like science, engineering, etc., found hidden in the great epic. It looked as though that all modern and latest discoveries and technological advancements in medicine, science and other disciplines are all made to prove that all these that existed in the Ramayanic age, as mentioned by Valmiki, are true. An initial desire to dig out this treasure led to an impulse to study it in depth. He then took it as a favourite pastime in all his leisure hours, to study the epic methodically, minutely, analytically, critically, etc. But a few passages, which refer to the astrological aspects, could not be well followed for want of a complete horoscope of Sri Rama. A serious search was made. Nothing suitable for the purpose was available except one Rasi Kundali which states that Chandra is in Karkataka sign, which is the Lagna and all other planets except Budha, Rahu and Ketu are in their exalted signs. This is an incomplete piece of data for an astrologer for an in-depth study of the epic. For example the sesha in Guru Maha Dasa, which is the corner stone for the predictive astrology is missing. So the writer has no other way except to fall back upon the very words of Valmiki. The writer has such a strong and unshakable faith in Valmiki that he should have given in his slokas all the details required for posterity to study the epic critically from the astrological points of view also.

With this strong faith, the writer made an attempt to study deeply and analyse the following slokas in search of the missing details. In this analysis, what is attempted is not just a literal translation in whatever language and however linguistically correct it may be, but

a reasonable, intelligible and acceptable interpretation without intellectual speculation.

ततो यज्ञे समाप्ते तु ऋतूनां षट् समत्ययुः ।
ततश्च द्वादशे मासे चैत्रे नावमिके तिथौ ॥ ८ ॥
नक्षत्रे ऽदितिदैवत्ये स्वोच्चसंस्थेषु पञ्चसु ।
ग्रहेषु कर्कटे लग्ने वाक्पताविन्दुना सह ॥ ९ ॥
प्रोद्यमाने जगन्नाथं सर्वलोकनमस्कृतम् ।
कौसल्याजनयद्रामं सर्वलक्षणसंयुतम् ॥ १० ॥

Bala Kanda, Sarga 18.

These are the slokas which have been subjected to much torture by many commentators in remote and recent past, many of them in a parrot-like fashion have stated that five planets are in their exalted signs. The writer does not pretend to be a scholar, in Sanskrit or astrology. With moderate knowledge in both, with all the views in the background and with great devotion and invocation to Sri Rama and Ishta Devata, the writer plunged into the investigation of these slokas. Over a month long exercise and the consequent chanting of the magic name of Sri Lord Rama proved to be the simple recipe to achieve results quite satisfactory to the writer. The writer now desires to share the results with his readers, only with the prime view to disseminate information.

CHAPTER I

PROSE ORDER OF SLOKAS 8, 9, & 10, SARGA 18, BALA KANDA

ततः यज्ञे समाप्ते तु ऋतूनां षट् समत्ययु.
ततः द्वादशे मासे, चैत्रे नावमिके तिथौ च
अदितिदैवत्ये नक्षत्रे पञ्चसु ग्रहेषु स्वोच्च
संस्थेषु लग्ने वाक्पतौ इन्दुना सह
कर्कटे प्रोद्यमाने सर्वलोकनमस्कृतं
सर्वलक्षणसंयुतं रामं कौसल्या अजनयत् ॥

"In the meantime, after sacrifice was over, six seasons (each consisting of two months from Vasanta Rutu) rolled away one after another. Then at the twelfth month (after sacrifice was over) in the month of Chaitra, on the ninth lunar day (of the bright fortnight) when the asterism Punarvasu (presided by Aditi) was in the ascendant, when (as many as) five planets viz. Ravi, Chandra, Kuja, Sukra and Sani happened to be in one's own house or in exalted positions (just rose or raised in the zodiacal signs of Aries (Mesha) Cancer (Karkataka),Capricorn (Makara) Pisces (Meena) or Libra (Tula) and when Janma Lagna and Guru in conjunction with Chandra were just rising i.e., entering together simultaneously the zodiacal sign Karkataka i.e., Cancer, Kausalya (the eldest wife of Dasaratha) gave birth to Sri Rama, who is the Lord of the Universe and who is endowed with all auspicious divine marks."

VERIFICATION OF INPUT SLOKAS:

Slokas 8, 9 & 10 of Sarga 18 of Bala Kanda of Valmiki Ramayana serve as the main and only input for the discovery of the birth details of Sri Rama. These slokas are similar to any raw material required for any project. Before study, it is to be vouchsafed that these slokas are not spurious. The following is a fairly exhaustive check list for the verification.

CHECK LIST

Whether the slokas are in Anushtub Chandas:	Yes.
Whether each sloka contains two equal verses:	Yes.
Whether each verse has two equal quarters:	Yes.
Whether each quarter has eight syllables:	Yes.
Whether the fifth syllable in the first quarter is short:	Yes.
Whether the same words are found in the other versions, like Northern, Southern, Bombay edition, etc:	Yes.
Whether any controversy in the construction of these slokas has come to light:	No.
Whether the words in the slokas are simple, which is unique with Valmiki:	Yes.
Whether these slokas can be taken as genuine:	Yes.

ततः यज्ञे समाप्ते तु ऋतूनां षट् समत्ययुः

"then after the completion of the Yagna (sacrifice) six Rutus (seasons) rolled away".

At the very first glance, it may appear that one full year consisting of six seasons rolled away. But it should not be and is not so. The Putrakameshti performed by Dasaratha commenced in the Vasanta Rutu and in the month of Chaitra. It concluded in the next month of Vaishaka. i.e., in the same Vasanta Rutu. Six Rutus including this Vasanta Rutu rolled one after another. Though six Rutus rolled, yet it is not a full year. The last Rutu passed was Sisira. The events to follow will naturally be in the beginning of the next cycle i.e., Vasanta Rutu.

द्वादशे मासे चैत्रे

"at the twelfth month and during the month of Chaitra"

Thus Valmiki has clarified the following points clearly.

(a) It is the twelfth month after Putrakameshti was completed;

(b) It is in the month of Chaitra.

द्वादशे मासे

"during the twelfth month":

The very construction of the words that is "at the twelfth month" indicates that one full year of twelve months did not pass. In fact only ten months and a few days have passed since the conclusion of the Yagna. This confirms that the Putrakameshti which commenced in Chaitra concluded in the next month Vaishaka. A reference to the PERT CHART (Annexure 1) would show the various activities of the Yagna from its commencement to its conclusion. Thus the twelfth month from Vaishaka is the month Chaitra, under reference now.

Now let us examine the month Chaitra. The very emphatic mention of Chaitra should automatically eliminate any doubt about the month in which Sri Rama is born. None can assume any authority to investigate whether the birth could have taken place in any other month like Palguna.

Regarding the month Chaitra, there are two systems of reckoning in the present days. They are Chandramana and Sauryamana systems.

Chandramana System:

As per Chandramana system, the New Year starts after the Amavasya at the end of Palguna month. Valmiki has made it clear that the titi of Sri Rama is Navami. This means that eight titis have passed after the New Moon i.e., Amavasya. So Sri Rama is born in the month of Chaitra as per the Chandramana system.

Sauryamana or solar system:

There is a claim now that Surya Sidhanta, is the best known system in the present days. It is believed to have been current in the present form from the eleventh century A.D. only. Is this so? Let us see what Valmiki says about this

The Hindu solar year begins with the Sun's entry into Aries i.e., Mesha. This was happening in February of every year till the 15th century B.C. and in March till the 18th century A.D. But owing to greater length of the Hindu year, the first day of the solar year now falls on the 12th or 13th April of every year.

Again by Surya Sidhanta the poet has given the longitude of Sun as 9.0° at the time of Sri Rama's Birth. (See elsewhere for details).

Taking a day for a degree, eight full days have already lapsed after the entry of Sun in Aries i.e., Mesha, which is Chaitra month. Thus the month Chaitra mentioned by Valmiki is the month by both Chandramana and Sauryamana systems.

Twelfth month:

Regarding the twelfth month there appears to be a certain contention. In short the contention is this. "Putrakameshti ended in Chaitra month. After the payasam was taken by the queens of

Dasaratha, the births at the twelfth month i.e., Chaitra, look unusual because the period of development of a baby is usually ten months."

Now let us look into this aspect a little closer. First of all, Putrakameshti ended in Vaishaka though it started in Chaitra. At the almost fag end of the Yagna in Vaishaka, the Payasam handed over by Prajapatya Nara, was given to the wives of Dasaratha. Valmiki states in 1.16.30 that the conception took place not long after this 'Achirena' अचिरेण . Thus some time lapse between the administration of payasam and the conception is indicated by the poet. This period of time gap could as well be arrived at by a simple back calculation from the time of Sri Rama's Janana which took place at the twelfth month reckoned from Vaishaka i.e., at Chaitra month, Navami titi. So ten full months and a few days had elapsed after the administration of the payasam to the queens. Leaving about ten months for the normal period of the development of the child, only a few days are found in excess. These are the days referred to by the poet, by the word 'Achirena' अचिरेण i.e., shortly. A reference to the activities, 34-35, 35-36, 36-37 would show that this period is less than 23 days plus - b plus c. This is a normal way of giving birth.

नावमिके तिथौ "during the titi of Navami"

This is obviously in Sukla Paksha, as confirmed by the position of the Sun which is at 9.0° in its exalted position. Valmiki has categcrically said that the titi in which Sri Rama is born is Sukla Navami. Nobody has the authority to tamper with it by any kind of word twisting. From time immemorial, Hindus have adopted this and are celebrating Sri Rama Navami festival on this titi alone. Yet there appears to be a kind of controversy on a particular aspect in some quarters.

> "A contention is that Mesha Sukla Navami and Punarvasu nakshatra cannot come together. From the beginning of Mesha rasi to the end of Punarvasu it is 93° 20'. The interval of eight titis between the Sun&Moon is 8.0° × 12° which is 96.0°. Therefore, Sukla Navami should ordinarily begin at 96.0°.

No doubt, this is true ordinarily; but a close investigation of details may, however, disclose the weak points in such a straight and simple

calculation. Anyhow, before getting into any detailed mathematical calculations, let us take advantage of the ephemeris to search for any reliable evidence for the possibilities of Mesha Sukla Navami and Punarvasu nakshatra occurring on the same day. Suffice it, it is believed, to place before the readers the following planetary positions found in and extracted from "Raman's ninety year Ephemeris of Planetary Positions" (1891-1900 A.D.)by B.V. Raman and leave it to the readers to judge.

The following sayana longitudes of the planets are for 5.30 A.M., I.S.T., for the year 1953.

The Ayanamsa is given as 21° 45′ 18″.

Sun's position on 15.4.1953 in Sayana	25° 14
Sun's position on 25.4.1953 in Sayana	34° 59
So Sun's position on 20.4.1953 in Sayana	30° 06
Less Ayanamsa 21° 45′	8° 21
Sun's Nirayana longitude on 20.4.1953	8° 21
Moon's position on 19.4.1953 in Sayana	101° 46
Moon's position on 21.4.1953 in Sayana	126° 19
Moon's position on 20.4.1953 in sayana	113° 52
Less Ayanamsa 21° 45'	92° 17
Moon's Nirayana longitude on 20.4.1953	92° 17

The Nirayana longitude of the Sun is 8° 21' and can occur only after 8 days from the solar new year. The Nirayana longitude of Moon is 92° 17' and this fixes the nakshatra as Punarvasu. Thus it is seen that Mesha Sukla Navami and Punarvasu occurred on the same day on the 20th April, 1953 at 5.30 P.M. as per a modern ephemeris.

Now let us have a look into the conventional and traditional method adopted for reckoning of time which is the simplest and which may be understood and followed by any one. The system of reckoning the titis and nakshatras by Ghatikas and Vighatikas (Naligais and Vinadis in the south) in the Hindu and especially the vakya sidanta almanacs is very ancient and is followed even today. The duration is divided into a number of Ghatikas and Vighatikas or Naligais and Vinadis or Hindu hours of about 24 hours. A normal titi extends over 0.9483 of a day, while a mean nakshatra extends over 1.01191 days.

The solar and lunar anamolies etc., may make a titi or nakshatra longer or shorter. A reference to any almanac especially that of a Vakya Sidanta would reveal that the duration of nakshatras may vary from 52 to 68 ghatikas or naligais ordinarily. At times the limit goes beyond 68 ghatikas also. A titi or nakshatra may commence at any time of the day or night. This is normal. Now let us examine the period of nakshatra whose duration is 70 gatikas, which is just 2 gatikas over 68 gatikas.

The mean progress in a day

$$= 13^\circ\ 20' \times \frac{60}{70} \text{ i.e., } \frac{40}{3} \times \frac{60}{70} = 11^\circ.\ 4$$

Now let us consider a case when Amavasya (New Moon) occurred at 6 a.m. when Sun and Moon were 0° in Mesha and at the beginning of Aswini. Then when the Sun moves at its average rate of 1° per day, the Moon would move as given below.

At the end of Sun's	1°	Moon will be at the end of	11°.4
-do-	2°	-do-	22°.8
-do-	3°	-do-	34°.2
-do-	4°	-do-	45°.6
-do-	5°	-do-	57°.0
-do-	6°	-do-	68°.4
-do-	7°	-do-	79°.8
-do-	8°	-do-	91°.2

The extent of the segment of Punarvasu is from 80°.00 to 93° 20'. So Sukla Navami titi and Punarvasu can occur together.

A second case:

Now let us consider a second case. Since Mesha Sukla Pratama begins when the New Moon ends in the range 345° to 15°, let us consider the case when Amavasya occurred at the nakshatra Revati 350° i.e., 10° before Aswini and the average duration of a nakshatra is 64 gatikas.

Then the Moon moves in a day by $\dfrac{40}{3} \times \dfrac{60}{64} = 12^\circ.5$

Then the Sun and Moon move as shown below.

At the end of Sun's	1°	Moon will be at the end	2°.5
-do-	2°	-do-	15°.0
-do-	3°	-do-	27°.5
-do-	4°	-do-	40°.0
-do-	5°	-do-	52°.5
-do-	6°	-do-	65°.0
-do-	7°	-do-	77°.5
-do-	8°	-do-	90°.0

In this case also Sukla Navami and Punarvasu nakshatra occurred on the 9th day from Amavasya.

Thus it is very clear that there is every possibility of Sukla Navami and Punarvasu nakshatra to occur on the same day.

This should set at rest any contention.

अदितिदैवत्ये नक्षत्रे

"in the Punarvasu nakshatra".

The clue is found in the vedic Legend that Aditi was the mother of Gods and all vedic Gods are always linked with stars by Valmiki. Thus Aditi is linked with Punarvasu (POLLUX in European system)

Next let us look into the phrase

लग्ने वाक्पतौ इन्दुना सह कर्कटे प्रोद्यमाने

"when Janma Lagna and Guru together with Chandra had just risen in Karkataka sign".

Fixing the time of birth of Sri Rama:

Poet Valmiki has not given the time of birth of Sri Rama directly. The time of birth is very necessary to fix the beginning longitude of Janma Lagna. No doubt, the poet has stated that the Janma Lagna of Sri Rama is Cancer i.e., Karkataka. There is no difficulty in everyone accepting this; but the sesha in Janma Lagna is required for several purposes. Karkataka lagna spreads from 14 ghatikas, 19 vighatikas to 20 ghatikas 7 vighatikas i.e., about 2 hours and 19 minutes. In 2 hours 19 minutes, Moon can progress from 90° to 91° 10′, since the movement of Moon is about 33 minutes per hour.

So the Birth of Sri Rama should have taken place only between 90° to 91° 10', in Karkataka sign.

Valmiki in his phrase

लग्ने वाक्पतौ इन्दुना सह कर्कटे प्रोद्यमाने

has categorically stated that when Kausalya gave birth to Sri Rama, the Janma Lagna and Guru together with Moon just rose in Karkataka sign i.e., just entered the sign together simultaneously. By this Valmiki has disclosed the actual longitude of Janma Lagna, Chandra and Guru, correct to the second. If we assume 1" as the minimum, the longitude of Janma Lagna, Chandra and Guru should be 90° 00' 01". Obviously this is in Nirayana system. The vexed question of ayanamsa does not come in. Thus what is given by the poet is eternal for any period to come. Here we have to marvel at the use of the key word 'PRODYAMANE' as it unlocks the lid to expose the treasure stored in the form of valuable data required by posterity of Valmiki. The word 'PRODYAMANE' प्रोद्यमाने conveys the meaning as just rising. 'Rising' and in Hindi उदय होता हुआ is the meaning given in the Sanskrit-Hindi-English dictionary by Surya Kanta, published by M/s Orient Longman. This is the only proper and correct way of interpreting the meaning of this simple word. On the other hand, interpreting it in any other way would prove to be a case of word twisting or reading too much between the lines.

Calculation of Janma Lagna:

A simple and age long practice of calculating the Janma Lagna is by the method of Ghatikas and Vighatikas. The average duration of 60 ghatikas per day is distributed in all the twelve signs from Mesha to Meena. They are not equal in each sign. They vary according to the latitude. Sri Rama is born in Ayodhya. The latitude of Ayodhya is 26° 48' (North). For this latitude the rasimana is given in Annexure 3. These figures are taken from a sudha dhrik panchangam. According to these, the following is the calculation for finding out the birth time of Sri Rama.

Sign	Duration	
	Ghatikas	Vighatikas
Mesha	2	40
Vrishaba	4	47
Mithuna	5	32
Total	12	59

Thus Mithuna sign extends up to 12 ghatikas and 59 vighatikas. When we add the minimum of one vighatika to this, it just falls in Karkataka sign.

So the birth Time of Sri Rama is 13 Ghatikas, from the sunrise on that day.

13 ghatikas are equivalent to 5 hours 12 minutes.

If we add this to the local mean time (L.M.T.) of sun rise, we will get the birth Time of Sri Rama in L.M.T.

Analysis of the Phrase

स्वोच्च संस्थेषु पञ्चसु ग्रहेषु

"when five planets just rose in one's own house or rose to approach near their most exalted positions".

This is how poet Valmiki has employed just four or five words forming a simple declarative phrase to convey the positions of five planets in the horoscope of Sri Rama. As we all are already familiar with, it is the custom of Valmiki to be brief and employ shorter forms for metrical purposes. The words used also are simple. Sometimes due to over simplification the reader is misdirected. Here is such an instance. Almost all great and eminent commentators like Ramanujeuja, Govinda Rajeeya etc., have interpreted the expression to mean that five planets are in exaltation. Once started and embodied in the commentary, the concept perhaps gained an easy and rapid currency amongst other scholars also and almost all of them naturally felt bound as camp followers to shape their views accordingly. In this

interpretation except that five planets are in exalted positions, no additional information or clue is made available, like

the time of birth,
the sesha in Janma Lagna,
the sesha in Guru mahadasa,
the longitudes of the planets etc.

Notwithstanding the high authority of these esteemed commentators and with great reverence and salutations to them, let us pause for a while and indulge in an in-depth study of the expression in search of some more data or information, apart from the fact that a few planets are in their exalted signs.

If the intention of the poet was only to convey that certain planets were in their exalted signs, he could have said so using the word UCHA alone. There would have been no need or necessity to use another word 'SVA' compounded with it. Definitely Valmiki would not have used any word unnecessarily or redundantly. No doubt at all, that Valmiki should have been very well versed in the science of astrology also. Though Valmiki was not writing a text book on Sri Rama's horoscope , it is in the fitness of things to expect that he might have packed a few or lot of astrological information and data necessary for studying and comparing the horoscope of Sri Rama, in his chosen words or phrases. Thus the poet gives ample scope for creativity thinking without exaggerating or modifying the meaning or importance of the words or diluting their essence. Any inference or interpretation should be only without any violation and within the parameters or the four corners of the fundamentals and facts recorded by Valmiki in his epic. They are as follows:

1. Chaitra is the month in which Sri Rama is born.
2. Navami is the titi in which Sri Rama is born.
3. Punarvasu is the Janma nakshatra of Sri Rama.
4. Karkataka is the Janma Lagna of Sri Rama.

Svocha Samstheshu Panchasu Graheshu

If we analyse this expression, it will be seen that there are five distinct words. They are

Sva
ucha
samstheshu
panchasu
graheshu.

The relevant dictionary meanings of these words are,

Sva	..	one's own
ucha	..	the apex of the orbit of a planet (here 'orbit' means the path of the heavenly body)
samstheshu	..	to come or stay near
panchasu	..	five
graheshu	..	planets

The poet indicates two distinct conditions. They are
Sva samstha स्व संस्थ and उच्च संस्थ
ucha samstha.

'sva samstha' means 'coming and staying in one's own sign'. 'ucha samstha' means 'when the transit of the planet comes near and stays for a while in its apex i.e., parama ucha position'. Let us further indulge in the critical analysis of the phrase 'ucha samstha'

If Valmiki means, by 'ucha samstheshu', that the planets are in their signs in which they have their ucha position, the application of the word 'samstha' is not appropriate. The dictionary meaning of the word 'samstha' is 'to come and stay near'. In the case of a sign wherein a planet has already moved, it does not carry any sense that the respective planet is coming near to stay in that sign. Instead if a planet is already in a particular sign in which the particular planet has its exalted position, then there is meaning that it moves to go near the exalted position.

The dictionary meaning of the word 'ucha' is the 'apex of the orbit of a planet'. The apex means the summit or theculminating point which is the parama ucha position or exalted position. Orbit means 'the path in which heavenly body transits'. 'Samstha' means 'to come and stay near'. So the expression 'ucha samstha' conveys the meaning that 'when the transit of the planet comes near and stays in its apex i.e., parama ucha point'.

Investigation:

This could mean that one planet had just risen in its own sign and four planets had just risen to their own near deep exalted positions together, at the same moment. This also could mean that two, three or four planets could have risen in their own signs and the rest had just risen to their own deep exalted positions. But in the later case, a serious difficulty creeps in, in fixing the own sign of the planets Kuja, Budha, Guru, Sukra and Sani since they all possess two houses of their own (Svakshetra). Certainly the poet would not have given such a wide scope for misjudgement. Instead, if the planet in its own sign were either Sun or Moon, this difficulty does not arise. The poet has already stated that the planet Sun is in Mesha sign, which is not its own sign. So evidently he should have meant Moon alone and it is in its own sign i.e., Karkataka.

Now part of our interest is in locating the four planets in ucha positions.

Analysis of the word 'ucha':

Stanza 13 of Brihat Jataka of Varaha Mihira says thus:

> 'Mesha, Vrishaba, Makara, Kanya, Kataka, Meena and Tula are the exalted signs of seven planets respectively from the Sun onwards. The highest exaltation counting from the Sun are 10th, the 3rd, the 28th, the 15th, the 5th, the 27th and the 20th degrees of the several signs in their respective order. The Sun is exalted in Mesha but its parama ucha position will be in 10th degree'

Here one point requires repetition. As we have discussed earlier, parama ucha position is the most powerful position of a planet to occupy. Whenever Valmiki uses the word ucha he should have meant parama ucha position only. This means that when the Sun occupies its parama ucha position i.e., the 10th degree in Mesha sign, it gives the planet one full RUPA or 60 sashtiamsas, which is the full or 100% strength of ucha bala. Or again if a planet occupies 1° 30′ on either side of its parama ucha position i.e., between 8° 30′ and 11° 30′ in the case of Sun, then also it will have one full RUPA or 60 sashtiamsas. So is the case with the other planets also. In this background, let us now investigate the conditions of all the planets with regard to their actual positions in detail and in depth as indicated by Valmiki.

Sun:

This is in parama ucha position, but at 9° which also gives the Sun one full Rupa i.e., 60 sashtiamsas. The position of the Sun as 9°.0 is clarified by Valmiki, when he refers to the births of Sri Lakshmana and Sri Satrugna, in the later stanzas. He says that the Sun raised to its parama ucha position in his expression 'ABYUDITE RAVAU' अभ्युदिते रवौ i.e., 10° at the time of their births. These births took place just over 24 hours later than that of Sri Rama. Sun travels about 1 degree per day. So we can safely fix the longitude of Sun as 9°.0. No doubt, we can also fix it as 10°.0, if we can consider that the births of Sri Lakshmana and Sri Satrugna had occurred between 11° and 11° 30′ which is also the same as parama ucha position. But the position of the Sun shifts to 10°.0 at the time of the birth of Sri Rama. This means that the titi also shifts to dasami from navami. This is against what Valmiki has stated. So this fixes the longitude of the Sun as 9°.0

Moon:

Valmiki has made it very clear by his employment of the word 'PRODYAMANA' that the Udaya Lagna and Jupiter together with Moon had just risen or entered the sign Karkataka i.e., the gate of Karkataka together at the same instant. This automatically fixes the sign of Moon as Karkataka, which is its own sign (Swakshetra).

This kind of entry into the Karkataka at the same moment is an exceptionally rare phenomena. This goes to justify the Divinity of Sri. Rama. So the Moon is in 90° 00′ 01″, in his own house at the fourth pada.

Mars:

He could be taken as a planet raised to his own deepest exalted position of 298° in Makara sign.

Budha: (Mercury)

Budha is generally near the Sun. At the best it can be away from the Sun by 28° only. When the Sun is in its exalted position i.e., in

Mesha, Budha cannot be in its exalted position in Kanya. So Budha having been considered for its ucha position by Valmiki is ruled out.

Guru: (Jupiter)

No doubt, Guru is in his exalted sign i.e., Karkataka. Since he was at the same degree as that of Moon when he along with Moon just entered Karkataka, its longitude also automatically gets fixed as 90° 00′ 01″. If Guru were to be considered for its exalted position of 95° 0, it can happen only if it is between 93° 30′ and 96° 30′ In that case, the longitude of Moon also gets shifted to the same degrees, since Guru and Moon are to attain that position simultaneously. This will then mean that the Moon would have been in Pushya nakshatra. This is contradictory to what the poet has categorically stated. So the longitude of Guru gets fixed as 90°00′ 01″. This is not his parama ucha position to give him one full Rupa. So Valmiki could not have considered Guru for his ucha position.

Sukra: (Venus)

Like Budha, Sukra also should be near the Sun. Since the Sun is in Mesha, Sukra can be in Meena. The parama ucha position of Sukra is 357°.0. So we can fix the longitude of Sukra as 357°.0. Thus Sukra is another planet considered by Valmiki as the one in ucha position.

Saturn:

Saturn is the fourth planet to be considered as the planet which was in the ucha position. Its parama ucha position is 200°.0. Thus the longitude of Saturn gets fixed as 200°.0

Rahu & Ketu:

Just as Varaha Mihira has omitted reference to Rahu and Ketu, Valmiki also has omitted reference to them.

Summary

In summing up, the in-depth study and critical investigation of the expression 'SVOCHA SAMSTHESHU PANCHASU GRAHESHU' reveal that the Moon is in his own house i.e., Karkataka and the four planets, Sun, Kuja, Sukra and Sani are in their deep exalted positions, in Mesha, Makara, Meena and Tula respectively.

FLOW CHART FOR DISCOVERY OF SRI RAMA'S BIRTH DETAILS:

INPUT

Slokas 8,9,10, Sarga 18,
Bala Kanda of Valmiki Ramayna

↓

PROCESSING

Read, Analyse, Interpret, Investigate

↓

OUTPUT

1. The time of Sri Rama's Birth.
2. The exact longitude of Udaya Lagna.
3. The sesha in Janma Lagna.
4. The sesha in Guru's Mahadasa.
5. The longitudes of planets, Sun, Moon, Kuja, Guru, Sukra and Sani.
6. Datas for casting Bhava Spudam.
7. The elimination of the vexed Ayanamsa.

Thus their longitudes also get fixed as here under:

Sun.	9° 0
Moon	90° 00' 01"
Kuja	298° 00
Guru	90° 00' 01"
Sukra	357° 00
Sani	200° 00

By the above investigation and interpretation, the following important information and data are automatically made available as by-products.

1. The time of Birth of Sri Rama.
2. The exact longitude of Udaya Lagna.

3. The sesha in Janma Lagna.
4. The sesha in the Mahadasa of Guru.
5. The longitudes of six planets correct to the second.
6. Details for the Bhava Spudam.
7. The elimination of the vexed question of ayanamsa.

Yet the following details are found wanting.

1. The year of Birth of Sri Rama.
2. The longitudes of Bhuda, Rahu and Ketu.
3. The week day.

Having fixed the longitudes of the six planets viz. Ravi, Chandra, Kuja, Guru, Sukra and Sani, we can with some efforts calculate the longitude of the rest of the planets viz., Bhuda, Rahu and Ketu, if we can succeed in finding out the year and date of birth of Sri Rama. So our next major task is to find out the year and date of Sri Rama's birth, a task not so easy to perform due to the Herculean efforts involving a lot of astronomical and mathematical calculations for a remote past.

The vilest among men in this world is he who having pledged his word to grant the desire of suppliants who are themselves endowed with strength etc., and have also rendered good offices to him in the past, fails to implement his promise.

Bala Kanda - 4 - Canto 30 - Verse 71

RAJAM

CHAPTER II.

SEARCH OF SRI RAMA'S BIRTH YEAR, MONTH AND DATE:

II. Description of Tables II. 1; II. 2; & II. 3.

We all know and everybody agrees that Sri Rama's Avatar was earlier than that of Sri Krishna. Sri Krishna was born in 3200 B.C. So there is no purpose in searching for the date of Sri Rama's birth between 1 B.C. to 3200 B.C. Further the Ikshavaku dynasty terminated in Kali Yuga. (vide. Skanda 9, Adyaya 12, Sloka 16 of Srimad Bhaghavata). There were 59 kings who ruled after Sri Rama. The names of these kings are as follows.

Kosalas.

1. Sri Rama
2. Kusa
3. Athithi
4. Nishada
5. Nabha
6. Pundarika
7. Kshemadanvan
8. Devanika
9. Aneeha
10. Pariyatra
11. Balasthala
12. Vajranabha
13. Kagana
14. Vidhruti
15. Hiranyanabha
16. Pushya
17. Dhruvasandhi
18. Sudharsan
19. Agnivarna
20. Sighra
21. Maru
22. Prasusrutha
23. Sandhi
24. Amarshana

These are the kings who ruled till Sri Suka narrated to Parikshit.

Sri Suka further narrates the future kings who would rule till Kali Yuga. They are

25. Mahaswan
26. Viswahaswa
27. Prasenajit
28. Takshaka
29. Brihatbala
30. Bruhadranan
31. Urukriyan
32. Vatsabridhan
33. Prithividman
34. Banu
35. Divakanu
36. Sahadevan
37. Brihadasva
38. Banuman
39. Prathikasva
40. Suprathika
41. Marudevan
42. Sunadshatra

43. Pushkara
44. Antariksha
45. Sutapa
46. Amitrajit
47. Brihatraja
48. Barhi
49. Kritayagnan
50. Rananjayan
51. Sanjayan
52. Sakyan
53. Sudhoda
54. Langala
55. Prasenajit
56. Kshutraka
57. Rangan
58. Suratan
59. Sumitra

With Sumitra Ikshavaku dynasty terminated in Kali Yuga. Assuming that each reign lasted an average of 20 years, somewhere by 4300 B.C., Sri Rama should have ruled. A search between 4300 to 4500 B.C. would have been sufficient. Yet in order not to miss any possibility of a date before 4300 B.C., it was thought that a search between 3500 B.C. and 4700 B.C., would be more exhaustive. So though tedious it was decided to select the period 3500 B.C. to 4700 B.C. for a thorough investigation.

Method of Investigation:

We have already seen earlier that the year in which Sri Rama was born, both the solar and lunar new years occurred on the same date. So we have to find out first the solar new year days between 3500 B.C., and 4700 B.C.

Late Diwan Bahadur L.D. Swamikannu Pillai has worked out the solar new year days in his book 'Indian Ephemeris'. He has worked out for the period 1 B.C., to 3201 B.C. We require these solar new year days for the earlier period.

So the author of this book has calculated the same up to 4700 B.C., following the same method and formula adopted by L.D. Swamikannu Pillai. These results are given in Table II. 1.

It may be noted that the entry of Sun in the sign of Aries, i.e., Mesha as per the sidereal luni-solar system gets shifted backward by about a day for every 100 years from 1 B.C.This is as per the precession of equinox and satisfies all the technical parameters required. When one is engaged in investigating and fact finding research work of historical periods, one has to adopt scientific methods acceptable to all. This method gives directly the year, month, date and exact

moment of the entry of Sun in Aries. It plays the key function in short-listing the probable years of birth of Sri Rama. This method of approach is preferred by the author to simplify the selection and narrow down the probable years by the well recommended process of elimination. Perhaps, but for this method, the selection of the probable years would have continued to be baffling, since the fixation of the date of birth of Sri Rama has been defying a satisfactory solution so long, even though Herculean atempts were made by great scholars, scientists, astronomers, astrologers etc., of international repute, both in the near and distant past almost in most parts of this country as well as in advanced countries. Instead, if the author had given the date of birth straight in a take-it-for-granted style, without accounting as to how it was arrived at, it may lead a reader to guess that there can be some more dates qualifying for consideration. Now any reader will get convinced that there is no possibility of any other date satisfying the technical parameters of fixing the date of birth of Sri Rama.

Description of Table II. 1

Section k of the Table tells us that in 4401 B.C., the solar year commenced on February, 4.45455 day. Section n further shows that for 32 years of the century, the fraction to be subtracted for determining the commencement of solar year is 0.28020. So in the year 4433 B.C., the solar new year commenced on February, 3.1743425 day, according to Surya Sidhanta. Table II. 2 which gives the fraction to be added or subtracted as the case may be, for determining the commencement of solar year in that century is also appended.

With the help of these two tables, it is possible to find out the solar new year from 1 B.C., to 4701 B.C. The commencements of solar new year, month and fraction of the day are given in the columns (2) and (3) in Table II. 3.

Selection of solar new years for probable years of birth of Sri Rama:

Valmiki has stated that Sun was in ucha position, when Sri Rama was born. Sun will be in ucha position between 8°.30′ and 11°.30′ Sun should be at 9°.0′ at the time of birth of Sri Rama, as we have already discussed. It can be so only if the birth took place on the

ninth day from any solar new year day. Evidently the solar new year should have commenced close to the 0 hours on the particular solar new year. Even if it commenced at 0 hours, the Sun can be near 8°.30′ on the ninth day at 10.799667 hours A.M., assuming that the daily motion of Sun was 1 degree per day. With an usual higher rate of daily motion, the longitude can be 9°, . Any way we have fixed the longitude of Sun as 9° at the time of Sri Rama's birth, for the following reasons.

Valmiki has also said that when the twins Sri Lakshmana and Sri Satrugna were born in Karkataka lagna, the Sun attained its most exalted position, which is 10°. Sri Rama's birth took place in the same Karkataka lagna on the previous day. As Sun's daily motion is 1° the longitude of Sun at the time of His birth in Karkataka lagna must necessarily be 9°. This fixation is as per the direction of Valmiki.

So in selecting the probable year of birth of Sri Rama, it is necessary that the solar year commenced close to 0 hour and in any case not later that sunrise. Thus solar years which commenced between 0 to 0.25 day are selected for further investigation.

All such solar years selected are given in the short list.

Lunar New Year:

As is well known, Chaitra Sukla Pratama follows the Palguna Amavasya.

As is said in Chapter 27, verse 38 of Brahmananda Purana,

एक रात्रे समेयातां सूर्यौ चन्द्रससावुभौ
अमावास्यानिशायान्तु तस्यामुक्तः सदावसेत् ॥

night when the Sun and Moon end together is known as Amavasya.

Titis:

Titis are in use over the whole of India for religious purposes and over the greater part of it for civil purposes also.

Reckoning a day by a titi appears to have been the way for religious purposes, even prior to the time of Rama. To understand titis, our ancients should have mastered the system thoroughly. Hence titis took the lead. The Sun and Moon are together at the end of the New Moon. Thereafter the Moon gains over the Sun and comes back to the Sun at the end of the next New Moon.

The travel of a lunation of a synodical month is divided into thirty equal parts i.e., titis or lunar days of equal mean length.

The first 15 titis corresponding to the bright half of the month are called Sukla Paksha and they are named as Pratama, Dwitiya etc. The fifteenth in Poornima (Full Moon). Again the titis are counted as before Pratama, Dwitiya, Tritiya etc. These fifteen titis are in the dark fortnight (Krishna Paksha). The last titi or the 30th titi is the New Moon or Amavasya. In Table II.3. these titis are given in Roman figures and they represent the titis as mentioned below and their equivalent synodical days are given against each titi.

Titi in Roman	Equivalent titi	Synodical days	Titi in Roman	Equivalent titi	Synodical days
SUKLA PAKSHA			KRISHNA PAKSHA		
0 - 1	Pratama	0.9843529	15 - 16	Pratama	15.749646
1 - 2	Dwitiya	1.9687058	16 - 17	Dwitiya	16.73999
2 - 3	Tritiya	2.9530587	17 - 18	Tritiya	17.71835
3 - 4	Chaturti	3.9374116	18 - 19	Chaturti	18.70270
4 - 5	Panchami	4.9217645	19 - 20	Panchami	19.68705
5 - 6	Sashti	5.9061174	20 - 21	Sashti	20.67141
6 - 7	Saptami	6.8904703	21 - 22	Saptami	21.65576
7 - 8	Ashtami	7.8591761	22 - 23	Ashtami	22.64011
8 - 9	Navami	8.8591761	23 - 24	Navami	23.38969
9 - 10	Dasami	9.843529	24 - 25	Dasami	24.60882
10 - 11	Ekadasi	10.827882	25 - 26	Ekadasi	25.59317
11 - 12	Dwadasi	11.812235	26 - 27	Dwadasi	26.57752
12 - 13	Trayodasi	12.796588	27 - 28	Trayodasi	27.56188
13 - 14	Chaturdasi	13.780941	28 - 29	Chaturdasi	28.54623
14 - 15	Poornima	14.749646	29 - 30	Amavasya	29.53058

Calculation of Titis:

Thus calculation of titis become important and frequent. Calculation of days between two dates e.g., between 17th February 3102 B.C., and 11th February 4433 B.C. is tedious and tiresome. If we reckon these two dates by a convenient system, the job becomes simple. One such system is reckoning the year and the day by Julian Day. By the use of the Julian days the interval between any two events can at once be established in precise manner. The starting point of the system is 4713 B.C. One year consists of 365¼ equal days.

Calculation of Julian day is as follows.

1. Subtract the English B.C. year from 4713 B.C.
2. Multiply the result by 365.
3. Add 3 to the result of item (1) and divide by 4.
4. Add the integer part of the result arrived at above, to item (2).
5. Add to the above the number of days from 1st January till the required date excluding the 1st January.
6. The total is the Julian Day for the required date and year.

Example:

Find out the Julian Day for 11th February, 4433 B.C.

1 Subtract 4433 from 4713	= 280
2 Multiply (1) by 365	= 102200
3 Add 3 to 280 and divide by 4	= 70.75
4 Add the integer part i.e., 70 to (2)	= 102270
5 Add the number of days from 1st January 4433 B.C. to 11th February 4433 B.C. excluding 1st January	= 41
	102311

So the Julian Day for the required date is 102311.

Typical calculation of titi for a particular day:

Adopting the Amavasya on the 17th February, 3102 B.C., as the Key Amavasya, let us now calculate the titi for the 11th February 4433 B.C.

Julian Day on the 17th Feb. 3102 B.C.	588465
Julian Day on the 11th Feb. 4433 B.C.	102311
Difference	486154

Dividing the difference by 29.530587 synodical days,
We get 16462.727 i.e., 16462 lunations or synodical periods are completed leaving a balance of 0.727; a lunar month consists of 30 titis. So the balance is $0.727 \times 30 = 21.72$ titis.

Since we are calculating from 3102 B.C., to 4433 B.C., in the descending order, we have to subtract this from 30 and we get 8.28 i.e., Navami as the titi.

This means that the titi at midnight (24 hours) on the 11th Feb. 4433 B.C. was Sukla Navami, with a balance of (9 - 8.28) 0.72 day.

We want the titi at sunrise on the next day. So we have to add 0.25 to this and we get 8.53 as the titi.

The titis under column 4 of Table II.3 are calculated as above.

Selection of titis:

As per Hindu calender, a day is reckoned from sunrise to sunrise. When Palguna Amavasya ends during this period, the Mesha Sukla Pratama commences. In that case the solar and lunar new years will coincide. We have already seen earlier that the solar and lunar new years coincided in the year of Sri Rama's birth. This is a pre-requisite. Sri Rama was born at 10 hr. 47m. 48 secs. on the 9th day of the commencement of the solar year. The titi at that moment was Sukla Navami. What should be the range of titi at sunrise on the second day of the solar year, so that the Sukla Navami will rule at the time of Sri Rama's birth? Now let us calculate the same.

Duration of titis:

The duration in days between any two important events are as follows.

From	To	No.of days.
0.0hour on solar new year day	6 a.m on the next day	1.25
-do-	10h.47m.48 sec. on the 9th day.	8.4498611
6 a.m on the 2nd day to solar new year day	-do-	7.1998611

A normal titi extends over 0.9843 of a day; but the solar and lunar anamolies may make a titi or nakshatra longer or shorter. A reference to any almanac especially that of vakya sidhanta, would reveal that the duration may vary from 52 to 68 ghatikas or naligais ordinarily. At times, the limit may go beyond 68 ghatikas also. A difference of 8 ghatikas on either side of 60 ghatikas work out to 13.33%. If we apply this percentage to the normal duration of 0.9844,

the parameters will be 0.8531795 and 1.1156205 days. Let us now calculate in tabulated form the various parameters for the occurrence of Sukla Navami on the 9th day of the solar year.

Table

Day in solar year	Time	Lower Parameter Length/ Duration days	for Beginning of Sukla Navami	for end of Sukla Navami	Upper Parameter Length/ Duration	for Beginning of Sukla Navami	for Ending of Sukla Navami
2nd	6 A.M.	0.853	1.859	2.859	1.112	0.003	0.994
3rd	"	0.853	2.712	3.712	"	1.116	2.106
4th	"	0.853	3.565	4.565	"	2.227	3.218
5th	"	0.853	4.418	5.418	"	3.339	4.33
6th	"	0.853	5.271	6.271	"	4.451	5.442
7th	"	0.853	6.124	7.124	"	5.563	6.554
8th	"	0.853	6.977	7.977	"	6.675	7.66
9th	"	0.853	7.83	8.83	"	7.78	8.78
9th	4, 8hrs	0.17	8.00	9.00	0.222	8.0	9.0

Summary:

Thus we find that if the titi at sunrise on the next day of the solar new year which is given under column 4 is in the range of 0.003 to 2.859, the titi at the time of Sri Rama's birth can be between 8.0 and 9.0 which is Sukla Navami.

Such years have been identified and shortlisted for purpose of detailed investigation.

As a process of this investigation, let us work out an example say for 3rd February, 4433 B.C.

Calculation for solar new year on the 3rd February 4433 B.C.
Julian Day 102303

Commencement of Solar year: 0.174342 day in February, 4433 B.C.
Length of a titi in days: 1.069.

Titi at 6 a.m	on Julian Day	102304 (Table II.3)	0.31
"	"	102305	1.379
"	"	102306	2.448
"	"	102307	3.517
"	"	102308	4.586
"	"	102309	5.655
"	"	102310	6.724
"	"	102311	7.793

Length of titi from sunrise up to the birth time of Sri Rama

$$\frac{1.069}{24} \times 4.796667$$

$= 0.214$ and adding to the above 8.006

Thus the titi at 10h. 47m. 48secs. on the 11th February 4433 B.C. is Sukla Navami.

Note: The births of Sri Rama, Sri Bharata and the twins Sri Lakshmana and Sri Satrugna took place in the constellations of Punarvasu, Pushya and Ashlesha (twins) respectively; but the poet is silent about the titi at the time of the births of the twins. Evidently the titi at that time also must be the same as Navami. The length of the titi on that day was 1.069 days. So Sri Rama's birth should have taken place almost at the commencement of Navami titi and then only Navami titi could have extended up to the birth time of the twins on the next day. This is an important factor for compliance.

We now confirm that the birth of Sri Rama was almost at the commencement of Navami.

He, on the other hand, who honours as inviolable the plighted word, be it productive of good or evil, is a hero and the best of men.

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TABLE II.1

Commencement of solar new year, month and date:

Year of B.C.	Commencement of the year, month & date and fraction of day.		Year of B.C.	Commencement of the year, month & date and fraction of day.	
		k			k
1	March	13.98310	2501	Feb.	21.09189
101	"	13.10745	2601	"	20.21624
201	"	12.23180	2701	"	19.34059
301	"	11.35615	2801	"	18.46494
401	"	10.48051	2901	"	17.58930
501	"	9.60486	3001	"	16.71365
601	"	8.72921	3101	"	15.83800
701	"	7.85356	3102	"	15.57924
801	"	6.97791	3201	"	14.96235
901	"	6.10226	3301	"	14.0867
1001	"	5.22662	3401	"	13.21105
1101	"	4.35077	3501	"	12.3354
1201	"	3.47532	3601	"	11.45975
1301	"	2.59967	3701	"	10.5841
1401	"	1.72402	3801	"	9.70845
1501	Feb.	29.84837	3901	"	8.8328
1601	"	28.97273	4001	"	7.95715
1701	"	28.09708	4101	"	7.0815
1801	"	27.22143	4201	"	6.20585
1901	"	26.34578	4301	"	5.3302
2001	"	25.47013	4401	"	4.45455
2101	"	24.59448	4501	"	3.5789
2202	"	23.71883	4601	"	2.70325
2301	"	22.84319	4701	"	1.8276
2401	"	21.96754			

Table II.2.

Fraction of day marking commencement of solar year:

Years	n	years	n	years	n
1.	0.25876	35.	.05647	68.	.59543
2.	0.51751	36.	.31523	69.	.85419
3.	.77627	37.	.57399	70.	.11295
4.	.03502	38.	.83274	71.	.37170
5.	.29378	39.	.09150	72.	.63046
6.	.55254	40.	.35026	73.	.88922
7.	.81129	41.	.60901	74.	.14797
8.	.07005	42.	.86777	75.	.40673
9.	.32881	43.	.12652	76.	.66549
10.	.58756	44.	.38528	77.	.92424
11.	.84632	45.	.64404	78.	.18300
12.	.10508	46.	.90279	79.	.44170
13.	.36383	47.	.16155	80.	.70051
14.	.62259	48.	.42031	81.	.95927
15.	.88135	49.	.67906	82.	.21802
16.	.14010	50.	.93782	83.	.47678
17.	.39886	51.	.19658	84.	.73554
18.	.65761	52.	.45533	85.	.99430
19.	.91637	53.	.71409	86.	.25305
20.	.17513	54.	.97284	87.	.51181
21.	.43388	55.	.23160	88.	.77056
22.	.69264	56.	.49036	89.	.02932
23.	.95140	57.	.74911	90.	.28808
24.	.21015	58.	.00787	91.	.54683
25.	.46891	59.	.26663	92.	.80559
26.	0.72767	60.	.52538	93.	.06434
27.	.98642	61.	.78414	94.	.32310
28.	.24518	62.	.04290	95.	.58186
29.	.50393	63.	.30165	96.	.84061
30.	.76269	64.	.56041	97.	.09937
31.	.02145	65.	.81971	98.	.35813
32.	.28020	66.	.07792	99.	.61688
33.	.53896	67.	.33668	100.	.87565
34.	.79772				

TABLE II-3

SEARCH FOR THE PROBABLE YEARS OF SRI RAMA'S BIRTH FROM 3500 TO 4700 B.C.

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
442725	3501	Feb. 12.3354	23.593	-
442360	3502	" 12.076644	12.79	-
441995	3503	" 12.817887	1.99	-
441630	**3504**	" 12.559131	21.187	-
441264	3505	" 12.300374	9.37	-
440889	3506	" 12.041618	28.568	-
440534	3507	" 12.782861	17.765	-
440169	**3508**	" 12.524105	6.963	-
439803	3509	" 12.265348	25.145	-
439438	3510	" 12.006592	14.343	-
439073	3511	" 12.747835	3.541	-
438708	**3512**	" 12.489078	22.739	-
438342	3513	" 12.230222	10.921	-
437977	3514	" 12.971565	0.118	-
437612	3515	" 12.712809	19.316	-
437247	**3516**	" 12.4540525	8.514	-
436881	3517	" 12.195296	26.696	-
436516	3518	" 12.936539	15.894	-
436151	3519	" 12.677783	5.092	-
435786	**3520**	" 12.419026	24.29	-
435420	3521	" 12.16027	12.475	-
435055	3522	" 12.901513	1.673	-
434690	3523	" 12.642757	20.871	-
434325	**3524**	" 12.384000	10.069	-
433959	3525	" 12.125244	28.251	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day		Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)		(4)	(5)
433594	3526	Feb.	12.8664875	17.449	-
433229	3527	"	12.607731	6.6647	-
432864	**3528**	"	12.348974	25.845	-
432498	3529	"	12.090218	14.027	-
432133	3530	"	12.831461	3.225	-
431768	3531	"	12.572705	22.423	-
431403	**3532**	"	12.313948	11.621	-
431037	3533	"	12.055192	29.803	-
430672	3534	"	12.796435	19.001	-
430307	3535	"	12.537679	8.189	-
429942	**3536**	"	12.278922	27.397	-
429576	3537	"	12.020166	15.579	-
429211	3538	"	12.764095	4.777	-
428846	3539	"	12.502653	23.975	-
428481	**3540**	"	12.243896	13.173	-
428115	3541	"	12.98514	1.355	-
428750	3542	"	12.726383	20.553	-
427385	3543	"	12.467627	9.751	-
427020	**3544**	"	12.20887	28.949	-
426654	3545	"	12.950114	17.131	-
426289	3546	"	12.691357	6.329	-
425924	3547	"	12.432601	25.527	-
425559	**3548**	"	12.173844	14.725	-
425192	3549	"	11.915088	1.891	-
424827	3550	"	11.656332	21.089	-
424462	3551	"	11.397576	10.287	-
424097	**3552**	"	11.138819	29.485	-
423731	3553	"	11.88062	17.667	-
423366	3554	"	11.621306	6.865	-
423001	3555	"	11.362549	26.063	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
422636	**3556**	Feb. 11.103793	15.262	-
422270	3557	" 11.845036	3.464	-
421905	3558	" 11.58268	22.42	. -
421540	3559	" 11.327523	11.84	-
421175	**3560**	" **11.068767**	**1.038**	**Yes**
420809	3561	" 11.81001	19.219	-
420444	3562	" 11.551254	8.447	-
420079	3563	" 11.292497	27.615	-
419714	**3564**	" 11.033741	16.813	-
419348	3565	" 11.774984	4.995	-
418983	3566	" 11.516228	24.193	-
418618	3567	" 11.257471	13.394	-
418253	**3568**	" 11.998715	2.589	-
417887	3569	" 11.739958	20.771	-
417522	3570	" 11.481202	9.949	-
417157	3571	" 11.222445	29.167	-
416792	**3572**	" 11.963689	18.365	-
416426	3573	" 11.704932	6.547	-
416061	3574	" 11.446176	25.745	-
415696	3575	" 11.187419	14.943	-
415331	**3576**	" 11.928663	4.141	-
414965	3577	" 11.669906	22.323	-
414600	3578	" 11.41115	11.521	-
414235	**3579**	" **11.152293**	**0.719**	**Yes**
413870	**3580**	" 11.893637	19.918	-
413504	3581	" 11.63488	8.1	-
413139	3582	" 11.376124	27.298	-
412774	3583	" 11.117367	16.496	-
412409	**3584**	" 11.858611	5.694	-
412043	3585	" 11.599854	23.876	-

Julian Day	B.C. Year **Leap Years**	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
411678	3586	Feb. 11.341098	13.074	
411413	**3587**	**" 11.082341**	**2.272**	**Yes**
410948	**3588**	" 11.823585	21.471	-
410582	3589	" 11.564828	9.652	-
410217	3590	" 11.306072	28.85	-
409852	3591	" 11.047315	18.049	-
409487	**3592**	" 11.788559	7.247	-
409121	3593	" 11.529802	25.429	-
408756	3594	" 11.271046	14.622	-
408391	3595	" 11.012289	3.825	-
408026	**3596**	" 11.753533	23.023	-
407660	3597	" 11.494776	11.205	-
407295	**3598**	**" 11.23602**	**0.402**	**Yes**
406930	3599	" 11.977263	19.601	-
406565	**3600**	" 11.718507	8.8	-
406199	3601	" 11.45975	26.982	-
405834	3602	" 11.200994	16.81	-
405469	3603	" 11.942237	5.378	-
405104	**3604**	" 11.683481	24.576	-
404738	3605	" 11.424726	12.758	-
404373	**3606**	**" 11.165968**	**1.956**	**Yes**
404008	3607	" 11.907211	21.154	-
403643	**3608**	" 11.648454	10.352	-
403277	3609	" 11.389698	28.534	-
402912	3610	" 11.130941	17.737	-
402547	3611	" 11.872185	6.93	-
402182	**3612**	" 11.613428	26.128	-
401816	3613	" 11.354672	14.31	-
401451	3614	" 11.0959155	3.508	-
401086	3615	" 11.837159	22.706	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day		Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)		(4)	(5)
400721	**3616**	Feb.	11.578402	11.904	-
400355	3617	〃	11.319646	0.086	-
399990	3618	〃	11.060889	19.284	-
399625	3619	〃	11.800213	8.492	-
399260	**3620**	〃	11.543376	27.681	-
398894	3621	〃	11.28462	15.864	-
398529	3622	〃	11.025863	5.062	-
398164	3623	〃	11.767107	24.26	-
397799	**3624**	〃	11.50835	13.458	-
397433	**3625**	〃	**11.249594**	**1.64**	**Yes**
397068	3626	〃	11.990837	20.838	-
396703	3627	〃	11.732081	10.036	-
396338	**3628**	〃	11.473324	29.234	-
395972	3629	〃	11.214568	17.416	-
395607	3630	〃	11.955811	6.614	-
395242	3631	〃	11.697055	25.813	-
394877	**3632**	〃	11.438298	15.01	-
394511	3633	〃	11.179542	3.193	-
394146	3634	〃	11.920785	22.391	-
393781	3635	〃	11.662029	11.589	-
393416	**3636**	〃	11.403272	0.787	-
393050	3637	〃	11.144516	18.969	-
392685	3638	〃	11.885759	8.167	-
392322	3639	〃	11.627003	27.365	-
391955	**3640**	〃	11.368246	16.563	-
391589	3641	〃	11.10949	4.743	-
391224	3642	〃	11.850733	23.941	-
390859	3643	〃	11.591977	13.139	-
390494	**3644**	〃	11.333220	2.337	-
390128	3645	〃	11.074464	20.52	-

Julian Day	B.C. Year **Leap Years**	Commencement of Solar New Year, Month, Day and fraction of day		Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)		(4)	(5)
389762	3646	Feb.	10.815708	8.701	-
389397	3647	"	10.556952	27.899	-
389032	**3648**	"	10.298295	17.097	-
388666	3649	"	10.039439	5.279	-
388301	3650	"	10.780682	24.477	-
387936	3651	"	10.521926	13.675	-
387571	**3652**	"	10.263169	2.873	-
387205	3653	"	10.004143	21.055	-
386840	3654	"	10.745656	10.253	-
386475	3655	"	10.4869	29.451	-
386110	**3656**	"	10.228143	18.649	-
385744	3657	"	10.969387	6.832	-
385379	3658	"	10.710636	26.029	-
385014	3659	"	10.451874	15.227	-
384649	**3660**	"	10.193117	4.425	-
384283	3661	"	10.934361	22.608	-
383918	3662	"	10.675604	11.806	-
383553	3663	"	10.416848	1.004	-
383188	**3664**	"	10.158091	20.202	-
382822	3665	"	10.899335	8.384	-
382457	3666	"	10.640578	27.582	-
382092	3667	"	10.381822	16.78	-
381727	**3668**	"	10.123065	5.978	-
381361	3669	"	10.864309	24.16	-
380996	3670	"	10.605552	13.358	-
380631	3671	"	10.346796	2.556	-
380266	**3672**	"	10.088039	21.754	-
379900	3673	"	10.829283	9.936	-
379535	3674	"	10.570526	29.134	-
379170	3675	"	10.31177	18.332	-


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Julian Day	B.C. Year LeapYears	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected forfurther investigation
(1)	(2)	(3)	(4)	(5)
378805	**3676**	Feb. 10.053013	7.53	-
378439	3677	〃 10.794257	25.713	-
378074	3678	〃 10.5355	14.91	-
377709	3679	〃 10.276744	4.108	-
377344	**3680**	〃 10.017987	23.306	-
376978	3681	〃 10.759231	11.49	-
376613	3682	〃 10.500474	0.688	-
376248	3683	〃 10.241718	19.886	-
375883	**3684**	〃 10.982961	9.084	-
375517	3685	〃 10.724205	27.266	-
375152	3686	〃 10.465448	16.464	-
374787	3687	〃 10.206692	5.665	-
374422	**3688**	〃 10.947935	24.84	-
374056	3689	〃 10.689179	13.042	-
373691	3690	〃 10.430422	2.24	-
373326	3691	〃 10.171666	21.438	-
372961	**3692**	〃 10.912909	10.636	-
372595	3693	〃 10.654153	28.818	-
372230	3694	〃 10.395396	18.016	-
371865	3695	〃 10.13664	7.21	-
371500	**3696**	〃 10.877883	26.412	-
371134	3697	〃 10.619127	14.594	-
370769	3698	〃 10.36037	3.792	-
370404	3699	〃 10.101614	22.99	-
370039	**3700**	〃 10.842857	12.188	-
369673	3701	〃 10.584101	0.37	-
369308	3702	〃 10.325344	19.568	-
368943	3703	〃 10.066588	8.766	-
368578	**3704**	〃 10.807831	27.964	-
368212	3705	〃 10.549074	16.146	-

Julian Day	B.C. Year **Leap Years**	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
367847	3706	Feb. 10.290318	5.344	-
367482	3707	〃 10.031561	24.542	-
367117	**3708**	〃 10.772805	13.74	
366751	3709	〃 10.514048	1.922	-
366386	3710	〃 10.255292	21.12	-
366021	3711	〃 10.996535	10.318	-
365656	**3712**	〃 10.737779	29.516	-
365290	3713	〃 10.479022	17.699	-
364925	3714	〃 10.220266	6.897	-
364560	3715	〃 10.961509	26.095	-
364195	**3716**	〃 10.702753	15.293	-
363829	3717	〃 10.443996	3.475	-
363464	3718	〃 10.18524	22.673	-
363099	3719	〃 10.926483	11.871	-
362734	**3720**	〃 10.667727	1.069	-
362368	3721	〃 10.40897	19.251	-
362003	3722	〃 10.150215	8.449	-
361638	3723	〃 10.891457	27.467	-
361273	**3724**	〃 10.632701	16.845	-
360907	3725	〃 10.373944	5.027	-
360542	3726	〃 10.115188	24.225	-
360177	3727	〃 10.856431	13.423	-
359812	**3728**	〃 10.597675	2.621	-
359446	3729	〃 10.338918	20.804	-
359081	3730	〃 10.080162	10.002	-
358716	3731	〃 10.821405	29.2	-
358351	**3732**	〃 10.562649	18.398	-
357985	3733	〃 10.303892	6.58	-
357620	3734	〃 10.045136	25.778	-
357255	3735	〃 10.786379	14.976	-

Julian Day	B.C. Year **Leap Years**	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
356890	**3736**	Feb. 10.527623	4.174	-
356524	3737	〃 10.268866	22.356	-
356159	3738	〃 10.01011	11.554	-
355794	3739	〃 10.751353	0.752	-
355429	**3740**	〃 10.49259	19.95	-
355063	3741	〃 10.233840	8.133	-
354697	3742	〃 9.975084	26.315	-
354332	3743	〃 9.716328	15.512	-
353967	**3744**	〃 9.457571	4.71	-
353601	3745	〃 9.198815	22.892	-
353236	3746	〃 9.940058	12.09	-
352871	3747	〃 9.681302	1.288	-
352506	**3748**	〃 9.422545	20.486	-
352140	3749	〃 9.163789	8.668	-
351775	3750	〃 9.905032	27.866	-
351410	3751	〃 9.646276	17.064	-
351045	**3752**	〃 9.387519	6.262	-
350679	3753	〃 9.128763	2.445	-
350314	3754	〃 9.870006	13.642	-
349949	3755	〃 9.61125	2.840	-
349584	**3756**	〃 9.352493	22.038	-
349218	3757	〃 9.093737	10.221	-
348853	3758	〃 9.83498	29.419	-
348488	3759	〃 9.576224	18.617	-
348123	**3760**	〃 9.317467	7.815	-
347757	3761	〃 9.058711	25.998	-
347392	3762	〃 9.799954	15.196	-
347027	3763	〃 9.541198	4.394	-
346662	**3764**	〃 9.282441	23.592	-
346296	3765	〃 9.023685	11.774	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
345931	3766	Feb. 9.764928	0.972	-
345566	3767	" 9.506172	20.17	-
345201	**3768**	" 9.247415	9.368	-
344835	3769	" 9.988659	27.55	-
344470	3770	" 9.729902	16.749	-
344105	3771	" 9.471146	5.947	-
343740	**3772**	" 9.212382	25.145	-
343374	3773	" 9.955363	13.327	-
343009	3774	" 9.694876	2.525	-
342644	3775	" 9.43612	21.723	-
342279	**3776**	" 9.177363	10.921	-
341913	3777	" 9.918607	29.103	-
341548	3778	" 9.65985	18.301	-
341183	3779	" 9.401094	7.499	-
340818	**3780**	" 9.142337	26.697	-
340452	3781	" 9.883581	14.879	-
340087	3782	" 9.624824	4.077	-
339772	3783	" 9.366068	23.275	-
339357	**3784**	" 9.107311	12.473	-
338991	3785	" 9.84855	0.655	-
338626	3786	" 9.589798	19.853	-
338261	3787	" 9.331042	9.051	-
337896	**3788**	" 9.072285	28.249	-
337530	3789	" 9.813529	16.432	-
337165	3790	" 9.554772	5.629	-
336800	3791	" 9.296016	24.828	-
336435	**3792**	" 9.037259	14.026	-
336069	3793	" 9.778503	2.208	-
335704	3794	" 9.519746	21.406	-
335339	3795	" 9.26099	10.064	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
334974	**3796**	Feb. 9.002233	29.802	-
334608	3797	" 9.743477	17.984	-
334243	3798	" 9.48472	7.182	-
333878	3799	" 9.225964	26.38	-
333513	**3800**	" 9.967207	15.578	-
333147	3801	" 9.708450	3.76	—
332782	3802	" 9.449694	22.958	—
332417	3803	" 9.190936	12.156	—
332052	**3804**	" 9.932181	1.354	—
331686	3805	" 9.673424	19.536	—
331321	3806	" 9.414668	8.734	—
330956	3807	" 9.155911	27.932	—
330591	**3808**	" 9.897155	17.13	—
330225	3809	" 9.638398	5.132	—
329860	3810	" 9.379642	24.51	—
329495	3811	" 9.120885	13.708	—
329130	**3812**	" 9.862129	2.906	—
328764	3813	" 9.603372	21.089	—
328399	3814	" 9.344616	10.287	—
328034	3815	" 9.085859	29.485	—
327669	**3816**	" 9.827103	18.682	—
327303	3817	" 9.568346	6.865	—
326938	3818	" 9.30959	26.063	—
326573	3819	" 9.050833	15.261	—
326208	**3820**	" 9.792077	4.459	—
325842	3821	" 9.533320	22.641	—
325477	3822	" 9.274564	11.839	—
325112	**3823**	**" 9.015807**	**1.037**	**Yes**
324747	3824	" 9.757051	20.235	—
324381	3825	" 9.498294	8.417	—

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day		Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)		(4)	(5)
324016	3826	Feb.	9.239538	27.615	–
323651	3827	"	9.980781	16.814	–
323286	**3828**	"	9.722025	6.011	–
322920	3829	"	9.463268	24.194	–
322555	3830	"	9.204512	13.392	–
322190	3831	"	9.945755	2.59	–
321825	**3832**	"	9.686999	21.788	–
321459	3833	"	9.428242	9.97	–
321094	3834	"	9.169486	29.168	–
320729	3835	"	9.910729	18.366	–
320364	**3836**	"	9.651973	7.564	–
319998	3837	"	9.393316	25.746	–
319633	3838	"	9.13446	14.944	–
319267	3839	"	8.875704	3.124	–
318902	**3840**	"	8.616947	22.324	–
318536	3841	"	8.358191	10.506	–
318171	3842	"	8.099434	29.704	–
317806	3843	"	8.840678	18.902	–
317441	**3844**	"	8.581921	8.1	–
317075	3845	"	8.323165	26.282	–
316710	3846	"	8.064408	15.48	–
316345	3847	"	8.805652	4.678	–
315980	**3848**	"	8.546895	23.876	–
315614	3849	"	8.288139	12.058	–
315249	**3850**	**"**	**8.029382**	**1.257**	**Yes**
314884	3851	"	8.770626	20.455	–
314519	**3852**	"	8.511869	9.6	–
314153	3853	"	8.253113	27.835	–
313788	3854	"	8.994356	17.032	–
313423	3855	"	8.7356	6.231	–

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
313058	**3856**	Feb. 8.476843	25.429	–
312692	3857	" 8.218087	13.611	–
312327	3858	" 8.95933	2.809	–
311962	3859	" 8.700574	22.007	–
311597	**3860**	" 8.441817	11.205	–
311231	3861	" 8.183061	29.388	–
310866	3862	" 8.924304	18.586	–
310501	3863	" 8.665548	7.784	–
310136	**3864**	" 8.406791	26.982	–
309770	3865	" 8.148035	15.164	–
309405	3866	" 8.889278	4.362	–
309040	3867	" 8.630522	23.56	–
308675	**3868**	" 8.371765	12.758	–
308309	**3869**	**" 8.113009**	**00.94**	**Yes**
307944	3870	" 8.854252	20.139	–
307579	3871	" 8.595496	9.337	–
307214	**3872**	" 8.336739	28.535	–
306848	3873	" 8.077983	16.717	–
306483	3874	" 8.819226	5.915	–
306118	3875	" 8.56047	25.113	–
305753	**3876**	" 8.301713	14.311	–
305387	**3877**	**" 8.042957**	**2.493**	**Yes**
305022	3878	" 8.7842	21.691	–
304657	3879	" 8.525448	10.89	–
304292	**3880**	" 8.266687	0.087	–
303926	3881	" 8.007931	18.267	–
303561	3882	" 8.749174	7.465	–
303196	3883	" 8.490418	26.663	–
302831	**3884**	" 8.231661	15.861	–
302465	3885	" 8.972955	4.043	–

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
302100	3886	Feb. 8.714148	23.241	–
301735	3887	〃 8.455392	12.439	–
301370	**3888**	**〃 8.196635**	**1.637**	**Yes**
301004	3889	〃 8.937879	19.819	–
300639	3890	〃 8.679122	9.017	–
300274	3891	〃 8.420366	28.215	–
299909	**3892**	〃 8.161609	17.413	–
299543	3893	〃 8.902853	5.596	–
299178	3894	〃 8.644096	24.794	–
298813	3895	〃 8.38534	13.992	–
298448	**3896**	〃 8.126583	3.189	–
298082	3897	〃 8.867826	21.372	–
297717	3898	〃 8.60907	10.57	–
297352	3899	〃 8.350313	29.768	–
296987	**3900**	〃 8.091557	18.966	–
296621	3901	〃 8.832800	7.149	–
296256	3902	〃 8.574044	26.347	–
295891	3903	〃 8.316287	15.545	–
295526	**3904**	〃 8.056531	4.743	–
295160	3905	〃 8.797774	22.925	–
294795	3906	〃 8.539018	12.123	–
294430	3907	〃 8.280261	1.321	–
294065	**3908**	〃 8.021505	20.52	–
293699	3909	〃 8.762748	8.701	–
293334	3910	〃 8.503992	27.889	–
292969	3911	〃 8.245235	17.018	–
292604	**3912**	〃 8.986479	6.296	–
292238	3913	〃 8.727722	24.478	–
291873	3914	〃 8.468966	13.676	–
291508	3915	〃 8.210209	2.874	–

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
291143	**3916**	Feb. 8.951453	22.0722	–
290777	3917	" 8.692696	10.254	–
290412	3918	" 8.43394	29.452	–
290047	3919	" 8.175183	18.65	–
289682	**3920**	" 8.916427	7.848	–
289316	3921	" 8.657670	26.022	–
288951	3922	" 8.398914	15.22	–
288586	3923	" 8.140157	4.418	–
288221	**3924**	" 8.881401	23.616	–
287855	3925	" 8.622644	11.798	–
287490	3926	" 8.363888	0.996	–
287125	3927	" 8.105131	20.194	–
286760	**3928**	" 8.846375	9.392	–
286394	3929	" 8.587618	27.574	–
286029	3930	" 8.328862	16.722	–
285664	3931	" 8.070105	5.97	–
285299	**3932**	" 8.811349	25.168	–
284933	3933	" 8.552592	13.35	–
284568	3934	" 8.293836	2.548	–
284203	3935	" 8.035079	21.746	–
283837	**3936**	" 7.776323	9.928	–
283471	3937	" 7.517567	28.11	–
283106	3938	" 7.25881	17.308	–
282741	3939	" 7.000054	6.506	–
282376	**3940**	" 7.741297	25.72	–
282010	3941	" 7.482541	13.902	–
281645	3942	" 7.223754	3.1	–
281280	3943	" 7.965028	22.298	–
280915	**3944**	" 7.706271	11.496	–
280549	3945	" 7.447515	29.678	–

Julian Day	B.C. Year **Leap Years**	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
280184	3946	Feb. 7.188758	18.876	–
279819	3947	" 7.930	8.074	–
279454	**3948**	" 7.671245	27.272	–
279088	3949	" 7.412489	15.454	–
278723	3950	" 7.153752	4.652	–
278358	3951	" 7.894976	23.85	–
277993	**3952**	" 7.636219	13.048	–
277627	3953	" 7.377463	1.231	–
277262	3954	" 7.118706	20.429	–
276897	3955	" 7.85995	9.627	–
276532	**3956**	" 7.601193	28.825	–
276166	3957	" 7.342437	17.007	–
275801	3958	" 7.08368	6.205	–
275436	3959	" 7.824924	25.402	–
275071	**3960**	" 7.566167	14.601	–
274705	3961	" 7.307411	2.772	–
274340	3962	" 7.048654	21.97	–
273975	3963	" 7.789898	11.168	–
273610	**3964**	" 7.531141	0.366	–
273244	3965	" 7.272385	18.548	–
272879	3966	" 7.013628	7.746	–
272514	3967	" 7.754872	26.944	–
272149	**3968**	" 7.496115	16.142	–
271783	3969	" 7.237359	4.326	–
271418	3970	" 7.978602	23.522	–
271053	3971	" 7.719846	12.721	–
270688	**3972**	" 7.461089	1.919	–
270322	3973	" 7.202333	20.1	–
269957	3974	" 7.943576	9.299	–
269592	3975	" 7.68482	28.497	–

Julian Day	B.C. Year **Leap Years**	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
269227	**3976**	Feb. 7.426063	17.695	–
268861	3977	〃 7.167307	5.877	–
268496	3978	〃 7.90855	25.075	–
268131	3979	〃 7.649794	14.273	–
267766	**3980**	〃 7.391037	3.471	–
267400	3981	〃 7.132281	21.67	–
267035	3982	〃 7.873524	10.87	–
266670	3983	〃 7.614768	0.068	–
266305	**3984**	〃 7.356011	19.266	–
265939	3985	〃 7.097255	7.448	–
265574	3986	〃 7.838498	26.646	–
265209	3987	〃 7.579742	15.844	–
264844	**3988**	〃 7.320985	5.042	–
264478	3989	〃 7.062225	23.225	–
264113	3990	〃 7.803472	12.422	–
263748	3991	〃 7.544716	1.621	–
263383	**3992**	〃 7.285959	20.819	–
263017	3993	〃 7.027203	9.0	–
262652	3994	〃 7.768446	28.199	–
262287	3995	〃 7.509689	17.397	–
261922	**3996**	〃 7.250933	6.595	–
261556	3997	〃 7.992176	24.776	–
261191	3998	〃 7.73342	13.975	–
260826	3999	〃 7.474663	3.172	–
260461	**4000**	〃 7.215907	22.371	–
260095	4001	〃 7.95715	10.54	–
259730	4002	〃 7.698394	29.74	–
259365	4003	〃 7.439637	18.94	–
259000	**4004**	〃 7.180881	8.14	–

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
258634	4005	Feb. 7.922124	26.32	–
258269	4006	〃 7.663368	15.52	–
257904	4007	〃 7.404611	4.71	–
257539	**4008**	〃 7.145855	23.91	–
257173	4009	〃 7.887098	12.09	–
256808	4010	〃 7.628342	1.29	–
256443	4011	〃 7.369585	20.49	–
256078	**4012**	〃 7.110829	9.69	–
255712	4013	〃 7.852072	27.89	–
255347	4014	〃 7.593316	17.07	–
254982	4015	〃 7.334559	6.27	–
254617	**4016**	〃 7.075803	25.46	–
254251	4017	〃 7.817046	13.65	–
253886	4018	〃 7.55829	2.84	–
253521	4019	〃 7.299533	22.04	–
253156	**4020**	〃 7.040777	11.23	–
252790	4021	〃 7.78202	29.42	–
252425	4022	〃 7.523264	18.62	–
252060	4023	〃 7.264507	7.82	–
251695	**4024**	〃 7.005751	27.02	–
251329	4025	〃 7.746994	15.2	–
250964	4026	〃 7.488237	4.4	–
250599	4027	〃 7.229481	23.6	–
250234	**4028**	〃 7.970245	12.8	–
249868	4029	〃 7.711968	0.98	–
249503	4030	〃 7.453211	20.77	–
249138	4031	〃 7.194455	9.37	–
248773	**4032**	〃 7.935699	28.57	–
248407	4033	〃 7.676942	16.75	–
248042	4034	〃 7.418186	5.95	–

Julian Day	B.C. Year **Leap Years**	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
247677	4035	Feb. 7.159429	25.15	–
247312	**4036**	" 7.900673	14.35	–
246946	4037	" 7.641916	2.53	–
246581	4038	" 7.38316	21.72	–
246216	4039	" 7.124403	10.92	–
245851	**4040**	" 7.865647	0.13	–
245485	4041	" 7.60689	18.31	–
245120	4042	" 7.348134	7.51	–
244755	4043	" 7.089377	26.71	–
244390	**4044**	" 7.830621	15.91	–
244024	4045	" 7.571864	4.1	–
243659	4046	" 7.313108	23.29	–
243294	4047	" 7.054351	12.49	–
242929	**4048**	" 7.795595	1.7	–
242563	4049	" 7.536838	19.87	–
242198	4050	" 7.278082	9.07	–
241833	4051	" 7.019325	28.27	–
241468	**4052**	" 7.760569	17.47	–
241102	4053	" 7.501812	5.65	–
240737	4054	" 7.243056	24.85	–
240372	4055	" 7.984299	14.04	–
240007	**4056**	" 7.725543	3.24	–
239641	4057	" 7.466786	21.42	–
239276	4058	" 7.20803	10.62	–
238911	4059	" 7.949273	29.92	–
238546	**4060**	" 7.690517	19.01	–
238180	4061	" 7.43176	7.2	–
237815	4062	" 7.173004	26.4	–
237450	4063	" 7.914247	15.6	–
237085	**4064**	" 7.655491	4.79	–

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
236719	4065	Feb. 7.396734	22.98	–
236354	4066	" 7.137978	12.18	–
235989	4067	" 7.879221	1.37	–
235624	**4068**	" 7.620465	20.57	–
235258	4069	" 7.361708	8.75	–
234893	4070	" 7.102952	27.95	–
234528	4071	" 7.844195	17.15	–
234163	**4072**	" 7.585439	6.35	–
233797	4073	" 7.326682	24.53	–
233432	4074	" 7.067926	13.73	–
233067	4075	" 7.809169	2.93	–
232702	**4076**	" 7.550413	22.12	–
232336	4077	" 7.291656	10.31	–
231971	4078	" 7.032900	29.5	–
231606	4079	" 7.774143	18.7	–
231241	**4080**	" 7.515387	7.87	–
230875	4081	" 7.256630	26.08	–
230510	4082	" 7.997874	15.25	–
230145	4083	" 7.739117	4.48	–
229780	**4084**	" 7.480361	23.68	–
229414	4085	" 7.221604	11.86	–
229049	4086	" 7.962848	1.06	–
228684	4087	" 7.704091	20.24	–
228319	**4088**	" 7.445335	9.45	–
227953	4089	" 7.186578	27.64	–
227588	4090	" 7.927821	16.83	–
227223	4091	" 7.669065	6.03	–
226858	**4092**	" 7.410308	25.23	–
226492	4093	" 7.151552	13.41	–
226127	4094	" 7.892795	2.61	–

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
225762	4095	Feb. 7.634039	21.80	–
225397	**4096**	" 7.375282	11.0	–
225031	4097	" 7.116526	29.19	–
224666	4098	" 7.857769	18.39	–
224301	4099	" 7.599013	7.58	–
223936	**4100**	" 7.340256	26.77	–
223570	4101	" 7.081500	14.95	–
223205	4102	" 7.822744	4.15	–
222840	4103	" 7.563987	23.35	–
222475	**4104**	" 7.305231	12.55	–
222109	**4105**	**" 7.046474**	**0.73**	**Yes**
221744	4106	" 7.787718	19.93	–
221379	4107	" 7.528961	9.13	–
221014	**4108**	" 7.270205	28.33	–
220648	4109	" 7.011448	16.51	–
220283	4110	" 7.752692	5.71	–
219918	4111	" 7.493935	24.9	–
219553	**4112**	" 7.235179	14.1	–
219187	4113	" 7.976422	2.28	–
218822	4114	" 7.717666	21.48	–
218457	4115	" 7.458909	10.68	–
218092	**4116**	" 7.200153	29.88	–
217726	4117	" 7.941396	18.09	–
217361	4118	" 7.682639	7.26	–
216996	4119	" 7.423883	26.46	–
216631	**4120**	" 7.165126	15.64	–
216265	4121	" 7.906370	3.82	–
215900	4122	" 7.647613	23.02	–
215535	4123	" 7.388857	12.2	–
215170	**4124**	**" 7.130100**	**1.42**	**Yes**

Julian Day	B.C. Year **Leap Years**	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
214804	4125	Feb. 7.871344	19.6	–
214439	4126	" 7.612587	8.8	–
214074	4127	" 7.353831	28.0	–
213709	**4128**	" 7.095075	17.19	–
213342	4129	" 6.836318	4.36	–
212977	4130	" 6.577562	23.55	–
212612	4131	" 6.318805	12.75	–
212247	**4132**	" 6.060049	1.95	–
211881	4133	" 6.801292	20.13	–
211516	4134	" 6.542536	9.33	–
211151	4135	" 6.283779	28.54	–
210786	**4136**	" 6.025023	17.74	–
210420	4137	" 6.766266	5.92	–
210055	4138	" 6.50751	25.12	–
209690	4139	" 6.248753	14.32	–
209325	**4140**	" 6.989997	3.52	–
208959	4141	" 6.73124	21.7	–
208594	4142	" 6.472484	10.9	–
208229	**4143**	**" 6.213727**	**0.098**	**Yes**
207864	**4144**	" 6.954971	19.3	–
207498	4145	" 6.696214	7.48	–
207133	4146	" 6.437458	26.65	–
206768	4147	" 6.178701	15.88	–
206403	**4148**	" 6.919943	5.08	–
206037	4149	" 6.661188	23.26	–
205672	4150	" 6.402432	12.43	–
205307	**4151**	**" 6.143675**	**1.63**	**Yes**
204942	**4152**	" 6.884919	20.86	–
204576	4153	" 6,626162	9.04	–
204211	4154	" 6.367406	28.24	–

Julian Day	B.C. Year **Leap Years**	Commencement of Solar New Year, Month, Day and fraction of day		Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)		(4)	(5)
203846	4155	Feb	6.108649	17.44	–
203481	**4156**	"	6.849893	6.64	–
203115	4157	"	6.591136	24.82	–
202750	4158	"	6.332380	13.02	–
202385	4159	"	6.073623	3.21	–
202020	**4160**	"	6.814867	22.39	–
201654	4161	"	6.556110	10.59	–
201289	4162	"	6.297354	29.77	–
200924	4163	"	6.038597	18.91	–
200559	**4164**	"	6.779841	8.17	–
200193	4165	"	6.521084	26.34	–
199828	4166	"	6.262328	15.55	–
199463	4167	"	6.003571	4.74	–
199098	**4168**	"	6.744815	23.94	–
198732	4169	"	6.486058	12.12	–
198367	**4170**	**"**	**6.227302**	**1.32**	**Yes**
198002	4171	"	6.968545	20.52	–
197637	**4172**	"	6.708789	9.71	–
197271	4173	"	6.451032	27.89	–
196906	4174	"	6.192276	17.09	–
196541	4175	"	6.933519	6.29	–
196176	**4176**	"	6.674763	25.49	–
195810	4177	"	6.416006	13.67	–
195445	4178	"	6.15725	2.87	–
195080	4179	"	6.898493	22.06	–
194715	**4180**	"	6.639737	11.26	–
194349	4181	"	6.380980	29.44	–
193984	4182	"	6.122240	18.64	–
193619	4183	"	6.863467	7.84	–
193254	**4184**	"	6.604711	27.04	–

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
192888	4185	Feb. 6.345954	15.22	–
192523	4186	" 6.088719	4.42	–
192158	4187	" 6.828441	23.61	–
191793	**4188**	" 6.569684	12.81	–
191427	4189	" 6.310928	0.99	–
191062	4190	" 6.052171	20.19	–
190697	4191	" 6.793415	9.39	–
190332	**4192**	" 6.534658	28.59	–
189966	4193	" 6.275902	16.77	–
189601	4194	" 6.017145	5.97	–
189236	4195	" 6.758389	25.07	–
188871	4196	" 6.499632	14.37	–
188505	**4197**	**" 6.240876**	**2.55**	**Yes**
188140	4198	" 6.982119	21.75	–
187775	4199	" 6.723369	10.94	–
187410	**4200**	" 6.464606	0.16	–
187044	4201	" 6.205850	18.28	–
186679	4202	" 6.947094	7.48	–
186314	4203	" 6.668337	26.68	–
185949	**4204**	" 6.429580	15.88	–
185583	4205	" 6.170824	4.06	–
185218	4206	" 6.912068	23.26	–
184853	4207	" 6.653311	12.46	–
184488	**4208**	" 6.394555	1.66	–
184122	4209	" 6.135798	19.84	–
183757	4210	" 6.877042	9.04	–
183392	4211	" 6.618285	28.23	–
183027	**4212**	" 6.359529	17.43	–
182661	4213	" 6.100772	5.61	–
182296	4214	" 6.842016	24.81	–

Julian Day	B.C. Year **Leap Years**	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
181931	4215	Feb. 6.583259	14.01	–
181566	**4216**	" 6.324503	3.21	–
181200	4217	" 6.065746	21.39	–
180835	4218	" 6.806990	10.59	–
180470	4219	" 6.548233	29.79	–
180105	**4220**	" 6.289477	19.03	–
179739	4221	" 6.030720	7.21	–
179374	4222	" 6.771964	26.41	–
179009	4223	" 6.513207	15.61	–
178644	**4224**	" 6.254451	4.81	–
178277	4225	" 5.995694	21.97	–
177912	4226	" 5.736938	11.17	–
177547	4227	" 5.478181	0.37	–
177182	**4228**	" 5.219425	18.55	–
176816	4229	" 5.960668	7.75	–
176451	4230	" 5.701912	26.94	–
176086	4231	" 5.443155	16.14	–
175721	**4232**	" 5.184399	5.34	–
175355	4233	" 5.925642	23.52	–
174990	4234	" 5.666886	12.72	–
174625	4235	" 5.408129	1.91	–
174260	**4236**	" 5.149373	21.11	–
173894	4237	" 5.890616	9.29	–
173529	4238	" 5.631860	28.49	–
173164	4239	" 5.373103	17.69	–
172799	**4240**	" 5.114347	6.91	–
172433	4241	" 5.855590	25.09	–
172068	4242	" 5.596834	14.29	–
171703	4243	" 5.338077	3.49	–
171338	**4244**	" 5.079321	22.69	–

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
170972	4245	Feb. 5.820564	10.87	–
170607	4246	" 5.561808	0.067	–
170242	4247	" 5.303051	19.26	–
169877	**4248**	" 5.044295	8.46	–
169511	4249	" 5.785538	26.50	–
169146	4250	" 5.526782	15.84	–
168781	4251	" 5.268025	5.01	–
168416	**4252**	" 5.009269	24.32	–
168050	4253	" 5.750512	12.4	–
167685	4254	" 5.491756	1.6	–
167320	4255	" 5.232999	20.8	–
166955	**4256**	" 5.974243	10.0	–
166589	4257	" 5.715486	28.18	–
166224	4258	" 5.45673	17.37	–
165859	4259	" 5.197973	6.57	–
165494	**4260**	" 5.939217	25.77	–
165128	4261	" 5.680460	13.95	–
164763	4262	" 5.421704	3.15	–
164398	4263	" 5.162947	22.35	–
164033	**4264**	" 5.904191	11.55	–
163667	4265	" 5.645434	29.73	–
163302	4266	" 5.386678	18.93	–
162937	4267	" 5.127921	8.12	–
162572	**4268**	" 5.869165	27.32	–
162206	4269	" 5.610408	15.50	–
161841	4270	" 5.351652	4.72	–
161476	4271	" 5.092895	23.92	–
161111	**4272**	" 5.834139	13.12	–
160745	4273	" 5.575382	1.3	–
160380	4274	" 5.316626	20.5	–

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
160015	4275	Feb. 5.057869	9.69	–
159650	**4276**	" 5.799113	28.9	-
159284	4277	" 5.540356	17.07	-
158919	4278	" 5.2816	6.27	-
158554	4279	" 5.022843	25.47	-
158189	**4280**	" 5.764087	14.67	-
157823	4281	" 5.505333	2.86	-
157458	4282	" 5.246574	22.06	-
157093	4283	" 5.987817	11.25	-
156728	**4284**	" 5.729060	0.45	-
156362	4285	" 5.470304	18.63	-
155997	4286	" 5.211547	7.83	-
155632	4287	" 5.952791	27.03	-
155267	**4288**	" 5.694033	16.23	-
154901	4289	" 5.435278	4.41	-
154536	4290	" 5.176521.	23.59	-
154171	4291	" 5.917765	12.78	-
153806	**4292**	" 5.659008	1.99	-
153440	4293	" 5.400252	20.17	-
153075	4294	" 5.141495	9.37	-
152710	4295	" 5.882739	28.56	-
152345	**4296**	" 5.623982	17.76	-
151979	4297	" 5.365226	5.94	-
151614	4298	" 5.106459	25.14	-
151249	4299	" 5.847713	14.34	-
150884	**4300**	" 5.588956	3.55	-
150518	4301	" 5.330200	21.73	-
150153	4302	" 5.071444	10.93	-
149788	4303	" 5.812687	0.13	-
149423	**4304**	" 5.553931	19.34	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day		Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)		(4)	(5)
149057	4305	"	5.295174	7.59	-
148692	4306	"	5.036418	26.77	-
148327	4307	"	5.776661	15.97	-
147962	**4308**	"	5.518905	5.16	-
147596	4309	"	5.260148	23.34	-
147231	4310	"	5.001592	12.46	-
146866	4311	"	5.742635	1.66	-
146501	**4312**	"	5.483879	20.86	-
146135	4313	"	5.225122	9.03	-
145770	4314	"	5.966366	28.24	-
145405	4315	"	5.707609	17.44	-
145040	**4316**	"	5.448853	6.64	-
144674	4317	"	5.190096	24.72	-
144309	4318	"	5.93134	14.02	-
143944	4319	"	5.672583	3.22	-
143579	**4320**	"	5.413827	22.42	-
143213	4321	"	5.15507	10.6	-
142847	4322	"	4.896314	28.78	-
142482	4323	"	4.637557	17.99	-
142117	**4324**	"	4.378801	7.18	-
141751	4325	"	4.120044	25.37	-
141386	4326	"	4.861288	14.56	-
141021	4327	"	4.602531	3.76	-
140656	**4328**	"	4.343775	22.96	-
140290	4329	"	4.085018	11.14	-
139925	4330	"	4.826262	0.34	-
139560	4331	"	4.567505	19.53	-
139195	**4332**	"	4.308749	8.73	-
138829	4333	"	4.049992	26.91	-
138464	4334	"	4.791236	16.11	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day		Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)		(4)	(5)
138099	4335	"	4.543479	5.31	-
137734	**4336**	"	4.273723	**24.51**	-
137368	4337	"	4.014966	12.69	-
137003	4338	"	4.756210	1.89	-
136638	4339	"	4.497453	21.09	-
136273	**4340**	"	4.238897	10.3	-
135907	4341	"	4.979941	28.48	-
135542	4342	"	4.721184	17.68	-
135177	4343	"	4.462427	6.88	-
134812	**4344**	"	4.203671	26.07	-
134446	4345	"	4.944914	14.26	-
134081	4346	"	4.686158	3.46	-
133716	4347	"	4.427401	22.65	-
133351	**4348**	"	4.168645	11.85	-
132985	4349	"	4.909888	0.03	-
132620	4350	"	4.651132	19.23	-
132255	4351	"	4.392375	8.41	-
131890	**4352**	"	4.133619	27.47	-
131524	4353	"	4.874862	15.19	-
131159	4354	"	4.616106	4.99	-
130794	4355	"	4.357349	24.18	-
130429	**4356**	"	4.098593	13.38	-
130063	4357	"	4.839836	1.56	-
129698	4358	"	4.581080	20.76	-
129333	4359	"	4.322323	9.96	-
128968	**4360**	"	4.063567	29.16	-
128602	4361	"	4.804810	17.34	-
128237	4362	"	4.546054	6.54	-
127872	4363	"	4.287297	25.74	-
127507	**4364**	"	4.028541	14.93	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
127141	4365	" 4.769784	3.12	-
126776	4366	" 4.511028	22.32	-
126411	4367	" 4.252271	11.51	-
126046	**4368**	" 4.993515	0.71	-
125680	4369	" 4.734758	18.89	-
125315	4370	" 4.476002	8.11	-
124950	4371	" 4.217245	27.31	-
124585	**4372**	" 4.958489	16.51	-
124219	4373	" 4.699732	4.69	-
123854	4374	" 4.440976	23.89	-
123489	4375	" 4.182219	13.08	-
123124	**4376**	" 4.923463	2.28	-
122758	4377	" 4.664706	20.46	-
122393	4378	" 4.405950	9.56	-
122028	4379	" 4.147193	28.86	-
121663	**4380**	" 4.888436	18.06	-
121297	4381	" 4.629680	6.24	-
120932	4382	" 4.370923	25.44	-
120567	4383	" 4.112167	14.64	-
120202	**4384**	" 4.853410	3.85	-
119836	4385	" 4.594654	22.01	-
119471	4386	" 4.335897	11.21	-
119106	**4387**	" **4.077141**	**0.41**	**Yes**
118741	**4388**	" 4.818345	19.61	-
118375	4389	" 4.559628	7.79	-
118010	4390	" 4.300871	26.98	-
117645	4391	" 4.042115	16.18	-
117280	**4392**	" 4.783358	5.38	-
116914	4393	" 4.524602	23.56	-
116549	4394	" 4.265845	12.76	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day		Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)		(4)	(5)
116184	**4395**	"	**4.001089**	**1.96**	**Yes**
115819	**4396**	"	4.748332	21.16	-
115453	4397	"	4.489576	9.34	-
115088	4398	"	4.230819	28.54	-
114723	4399	"	4.972063	17.74	-
114358	**4400**	"	4.713306	6.94	-
113992	4401	"	4.45455	25.12	-
113627	4402	"	4.195794	14.32	-
113262	4403	"	4.937037	3.52	-
112897	**4404**	"	4.678287	22.72	-
112531	4405	"	4.419524	10.9	-
112166	**4406**	"	**4.160768**	**0.1**	**Yes**
111801	4407	"	4.902011	19.29	-
111436	**4408**	"	4.643255	8.49	-
111070	4409	"	4.384498	26.67	-
110705	4410	"	4.125742	15.87	-
110340	4411	"	4.866985	5.07	-
109975	**4412**	"	4.608229	24.27	-
109609	4413	"	4.349472	12.45	-
109244	**4414**	"	**4.090716**	**1.65**	**Yes**
109879	4415	"	4.831595	20.85	-
108514	**4416**	"	4.573203	10.04	-
108148	4417	"	4.314446	28.23	-
107783	4418	"	4.055690	17.42	-
107417	4419	"	3.796933	5.60	-
107052	**4420**	"	3.538177	24.79	-
106686	4421	"	3.279420	12.98	-
106321	**4422**	"	**3.020664**	**2.18**	**Yes**
105956	4423	"	3.761907	21.38	-
105591	**4424**	"	3.503151	10.58	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day		Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)		(4)	(5)
105225	4425	"	3.244394	28.76	-
105860	4426	"	3.985638	17.96	-
104495	4427	"	3.726881	7.15	-
104130	**4428**	"	3.468105	26.35	-
103764	4429	"	3.209368	14.53	-
103399	4430	"	3.950612	3.73	-
103034	4431	"	3.691855	22.93	-
102669	**4432**	"	3.433099	12.13	-
102303	**4433**	"	**3.174342**	**0.31**	**Yes**
101938	4434	"	3.915586	19.51	-
101573	4435	"	3.656829	8.71	-
101208	**4436**	"	3.398073	27.9	-
100842	4437	"	3.139316	16.09	-
100477	4438	"	3.880560	5.29	-
100112	4439	"	3.621803	24.48	-
99747	**4440**	"	3.363047	13.66	-
99381	**4441**	"	**3.104290**	**1.84**	**Yes**
99016	4442	"	3.845434	21.04	-
98651	4443	"	3.586777	10.24	-
98286	**4444**	"	3.328021	29.44	-
97920	4445	"	3.069264	17.62	-
97555	4446	"	3.810508	6.82	-
97190	4447	"	3.551751	26.01	-
96825	**4448**	"	3.292995	15.21	-
96459	4449	"	3.034238	3.39	-
96094	4450	"	3.775482	22.59	-
95729	4451	"	3.516725	11.8	-
95364	**4452**	"	3.257969	00.998	-
94998	4453	"	3.999212	19.18	-
94633	4454	"	3.740456	8.38	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day		Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)		(4)	(5)
94268	4455	"	3.481699	27.58	-
93903	**4456**	"	3.222943	16.77	-
93537	4457	"	3.964186	4.96	-
93172	4458	"	3.705430	24.15	-
92807	4459	"	3.446673	13.35	-
92442	**4460**	"	**3.187917**	**2.55**	**Yes**
92076	4461	"	3.929160	20.73	-
91711	4462	"	3.670404	9.93	-
91346	4463	"	3.411646	29.13	-
90981	**4464**	"	3.152891	18.33	-
90615	4465	"	3.894134	6.51	-
90250	4466	"	3.635378	25.71	-
89885	4467	"	3.376621	14.90	-
89520	**4468**	"	3.117860	4.7	-
89154	4469	"	3.859108	22.28	-
88789	4470	"	3.600352	11.5	-
88424	4471	"	3.341595	0.68	-
88059	**4472**	"	3.082839	19.88	-
87693	4473	"	3.824082	8.06	-
87328	4474	"	3.565326	27.26	-
86963	4475	"	3.306569	16.46	-
86598	**4476**	"	3.047813	5.66	-
86232	4477	"	3.789056	23.84	-
85867	4478	"	3.530299	13.04	-
85502	4479	"	3.271543	2.24	-
85137	**4480**	"	3.012786	21.43	-
84771	4481	"	3.75403	9.62	-
84406	4482	"	3.495273	28.81	-
84041	4483	"	3.236517	18.01	-
83676	**4484**	"	3.977760	7.21	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day		Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)		(4)	(5)
83310	4485	"	3.719004	25.39	-
82945	4486	"	3.460247	14.59	-
82580	4487	"	3.201491	3.79	-
82215	**4488**	"	3.942734	22.99	-
81849	4489	"	3.683878	11.16	-
81484	4490	"	3.425221	0.37	-
81119	4491	"	3.166465	19.57	-
80754	**4492**	"	3.907708	8.77	-
80388	4493	"	3.648952	26.95	-
80023	4494	"	3.390195	16.15	-
79658	4495	"	3.131439	5.35	-
79293	**4496**	"	3.872682	24.55	-
78927	4497	"	3.613926	12.73	-
78562	4498	"	3.35517	1.93	-
78197	4499	"	3.09641	21.12	-
77832	**4500**	"	3.83766	10.32	-
77466	4501	"	3.5789	28.51	-
77101	4502	"	3.320143	17.71	-
76736	4503	"	3.061387	6.91	-
76371	**4504**	"	3.802630	26.1	-
76005	4505	"	3.543874	14.29	-
75640	4506	"	3.285111	3.48	-
75275	4507	"	3.026361	22.69	-
74910	**4508**	"	3.767604	11.89	-
74544	4509	"	3.508848	0.08	-
74179	4510	"	3.250091	19.28	-
73814	4511	"	3.991335	8.47	-
73449	**4512**	"	3.732578	27.67	-
73083	4513	"	3.473822	15.86	-
72718	4514	"	3.215065	5.06	-

Julian Day	B.C. Year Leap Years	Commencement of Ŝolar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
72352	4515	" 2.95650	24.26	-
71987	**4516**	" 2.697552	13.46	-
71621	4517	" 2.438796	1.64	-
71256	4518	" 2.180039	20.85	-
70891	4519	" 2.921283	8.98	-
70526	**4520**	" 2.662527	28.18	-
70160	4521	" 2.40377	16.37	-
69795	4522	" 2.145014	5.57	-
69430	4523	" 2.886257	24.77	-
69065	**4524**	" 2.627501	13.96	-
68699	4525	" 2.368744	2.15	-
68334	4526	" 2.109988	21.35	-
67969	4527	" 2.851231	10.55	-
67604	**4528**	" 2.592475	29.74	-
67238	4529	" 2.333718	17.93	-
66873	4530	" 2.074962	7.1	-
66508	4531	" 2.816205	26.33	-
66143	**4532**	" 2.557449	15.53	-
65777	4533	" 2.298692	3.72	-
65412	4534	" 2.039936	22.92	-

The living beings inhabiting the sub-terranean regions are full of prowess and gigantic of body

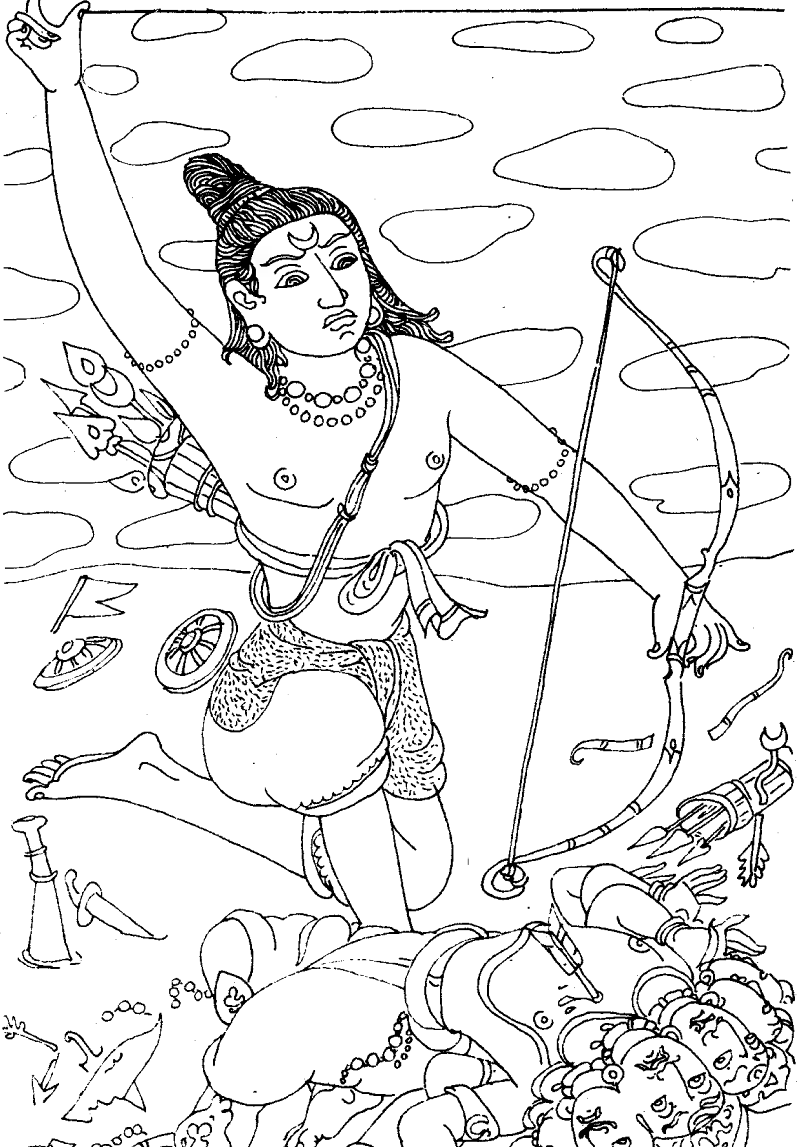
Balakanda - Canto 41
Verse 2

Julian Day	B.C. Year **Leap Years**	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
65047	4535	Feb. 2.781179	12.11	-
64682	**4536**	" 2.522423	1.31	-
64316	4537	" 2.263666	19.5	-
63951	4538	" 2.00491	8.7	-
63586	4539	" 2.746153	27.9	-
63221	**4540**	" 2.487397	17.1	-
62855	4541	" 2.22864	5.24	-
62490	4542	" 2.969884	24.44	-
62125	4543	" 2.711127	13.64	-
61760	**4544**	" 2.452371	2.83	-
61394	4545	" 2.193614	21.02	-
61029	4546	" 2.934858	10.22	-
60664	4547	" 2.676101	29.42	-
60299	**4548**	" 2.417345	18.62	-
59933	4549	" 2.158588	6,81	-
59568	4550	" 2.899832	26.01	-
59203	4551	" 2.641075	15.20	-
58838	**4552**	" 2.382319	4.4	-
58472	4553	" 2.123562	22.57	-
58107	4554	" 2.864806	11.79	-
57742	4555	" 2.606049	0.99	-
57377	**4556**	" 2.347293	20.18	-
57011	4557	" 2.088536	8.37	-
56646	4558	" 2.82978	27.57	-
56281	4559	" 2.571023	16.78	-
55916	**4560**	" 2.312267	5.97	-
55550	4561	" 2.05351	24.14	-
55185	4562	" 2.794754	13.34	-
54820	4563	" 2.535997	2.54	-
54455	**4564**	" 2.277241	21.73	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
54089	4565	Feb. 2.018484	9.92	-
53724	4566	" 2.759728	29.12	-
53359	4567	" 2.500971	18.32	-
52994	**4568**	" 2.242215	7.52	-
52628	4569	" 2.983458	25.71	-
52263	4570	" 2.724702	14.91	-
51898	4571	" 2.465745	4.1	-
51533	**4572**	" 2.207189	23.3	-
51167	4573	" 2.948432	11.5	-
50802	4574	" 2.687676	0.69	-
50437	4575	" 2.430919	19.89	-
50072	**4576**	" 2.172163	9.09	-
49706	4577	" 2.913406	27.22	-
49341	4578	" 2.654649	16.47	-
48976	4579	" 2.395893	5.67	-
48611	**4580**	" 2.137136	24.87	-
48245	4581	" 2.87838	13.01	-
47880	4582	" 2.619623	2.21	-
47515	4583	" 2.360867	21.41	-
47150	**4584**	" 2.102110	10.6	-
46784	4585	" 2.843354	28.79	-
46419	4586	" 2.584597	18.0	-
46054	4587	" 2.325841	7.19	-
45689	**4588**	" 2.067084	26.39	-
45323	4589	" 2.808328	14.58	-
44958	4590	" 2.549571	3.78	-
44593	4591	" 2.290815	22.97	-
44228	**4592**	" 2.032058	12.17	-
43862	4593	" 2.773302	0.36	-
43497	4594	" 2.514545	19.56	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
43132	4595	Feb. 2.255789	8.76	-
42767	**4596**	" 2.997032	27.95	-
42401	4597	" 2.738276	16.14	-
42036	4598	" 2.479519	5.34	-
41671	4599	" 2.220763	24.53	-
41306	**4600**	" 2.962006	13.73	-
40940	4601	" 2.70325	1.91	-
40575	4602	" 2.44449	21.11	-
40210	4603	" 2.185737	10.31	-
39845	**4604**	" 2.92698	29.5	-
39479	4605	" 2.668224	17.69	-
39114	4606	" 2.409467	6.89	-
38749	4607	" 2.150711	26.09	-
38384	**4608**	" 2.891954	15.29	-
38018	4609	" 2.633198	3.48	-
37653	4610	" 2.374441	22.68	-
37288	4611	" 2.114685	11.87	-
36922	**4612**	" 1.856926	1.07	-
36556	4613	" 1.598172	19.26	-
36191	4614	" 1.339415	8.46	-
35826	4615	" 1.080659	27.66	-
35461	**4616**	" 1.821907	15.85	-
35095	4617	" 1.563155	4.04	-
34730	4618	" 1.304402	23.24	-
34365	4619	" 1.04565	12.44	-
34000	**4620**	" 1.786987	1.64	-
33634	4621	" 1.528145	19.83	-
33269	4622	" 1.269392	9.03	-
32904	4623	" 1.01064	28.23	-
32539	**4624**	" 1.751887	17.42	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
32173	4625	Feb. 1.493135	5.51	-
31808	4626	〃 1.234382	24.72	-
31443	4627	〃 1.97563	13.93	-
31078	**4628**	〃 1.716877	3.11	-
30712	4629	〃 1.458125	21.31	-
30347	4630	〃 1.199372	10.51	-
29982	4631	〃 1.94062	29.71	-
29617	**4632**	〃 1.681867	18.91	-
29251	4633	〃 1.423115	7.09	-
28886	4634	〃 1.164362	26.29	-
28521	4635	〃 1.90561	15.49	-
28156	**4636**	〃 1.646859	4.69	-
27790	4637	〃 1.388105	22.89	-
27425	4638	〃 1.129352	12.07	-
27060	4639	〃 1.8706	1.27	-
26695	**4640**	〃 1.611847	20.47	-
26329	4641	〃 1.353095	8.63	-
25964	4642	〃 1.094342	27.83	-
25599	4643	〃 1.83559	17.03	-
25234	**4644**	〃 1.576837	6.23	-
24868	4645	〃 1.318085	24.42	-
24503	4646	〃 1.059332	13.62	-
24138	4647	〃 1.80058	2.82	-
23773	**4648**	〃 1.541827	22.02	-
23407	4649	〃 1.283075	10.21	-
23042	4650	〃 1.024322	29.41	-
22677	4651	〃 1.76557	18.61	-
22312	**4652**	〃 1.506817	7.81	-
21946	4653	〃 1.248065	26.0	-
21581	4654	〃 1.989312	15.2	-



Julian Day	B.C. Year **Leap Years**	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
21216	4655	Feb. 1.73056	4.4	-
20851	**4656**	" 1.471807	23.6	-
20485	4657	" 1.213055	11.79	-
20120	4658	" 1.954302	0.99	-
19755	4659	" 1.69555	20.19	-
19390	**4660**	" 1.436797	9.39	-
19024	4661	" 1.177882	27.53	-
18659	4662	" 1.919292	16.72	-
18294	4663	" 1.66054	5.92	-
17929	**4664**	" 1.401787	25.12	-
17563	4665	" 1.143035	13.3	-
17198	4666	" 1.884282	2.5	-
16833	4667	" 1.62553	21.7	-
16468	**4668**	" 1.36677	10.9	-
16102	4669	" 1.108025	29.08	-
15737	4670	" 1.849272	18.28	-
15372	4671	" 1.59052	7.48	-
15007	**4672**	" 1.331767	26.68	-
14641	4673	" 1.073015	15.88	-
14276	4674	" 1.814262	4.08	-
13911	4675	" 1.555095	23.28	-
13546	**4676**	" 1.296757	12.78	-
13180	**4677**	**" 1.038004**	**0.97**	**Yes**
12815	4678	" 1.779252	20.17	-
12450	4679	" 1.520499	9.36	-
12085	**4680**	" 1.261747	28.21	-
11719	4681	" 1.002994	16.4	-
11354	4682	" 1.744242	5.6	-
10989	4683	" 1.48548	24.8	-
10624	**4684**	" 1.226737	14.0	-

Julian Day	B.C. Year Leap Years	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Selected for further investigation
(1)	(2)	(3)	(4)	(5)
10258	4685	Feb. 1.967984	2.18	-
9893	4686	" 1.709232	21.38	-
9528	4687	" 1.450479	10.58	-
9163	**4688**	" 1.191727	29.78	-
8797	4689	" 1.932974	17.97	-
8432	4690	" 1.674222	7.17	-
8067	4691	" 1.415469	26.36	-
7702	**4692**	" 1.156717	15.56	-
7336	4693	" 1.897964	3.75	-
6971	4694	" 1.639212	22.95	-
6606	4695	" 1.380459	12.15	-
6241	**4696**	**" 1.121707**	**1.34**	**Yes**
5875	4697	" 1.862954	19.53	-
5510	4698	" 1.604202	8.73	-
5145	4699	" 1.345449	27.93	-
4780	**4700**	" 1.086697	17.11	-

Calculation of Moon's Longitude for 5 p.m. on solar new year days:

The longitudes of Moon given under column 5 in the short list (Table II.4) against respective solar new year days are as per the following typical calculations, treating the 10th January, 3104 B.C., as the key day, as the Moon was at 312.61 degrees at 5 p.m. as worked out by Prof. K. Srinivasa Raghavan.

Typical Calculation

Julian Day on the 10th January 3104 B.C.	587697
Julian Day on the 11th February 4433 B.C.	102311
Difference	485386

Dividing by 27.321661 synodical days. we get 17765.611
i.e., 17765 synodical periods have rolled.

The balance is 0.611 of the synodical period, So 0.611 × 360° i.e., 219°.96 got completed.

The longitude on the key day was 312°.61.
Subtract 219°.96 from 312°.61. We get 92°.65.

So the longitude at 5 p.m. on the 11th February 4433 B.C. was 92°.65. We have already seen that the birth of Sri Rama took place on the 9th day of a solar new year at 10.79667 hours a.m. and the longitude of Moon at the moment was 90°.0001.

The difference in days from 5 p.m. of a solar new year day up to 10.79667 hours a.m., on the 9th day is 7.7415277 days. Moon travels 13°.1764 per day and so 102°.005 in 7.7415277 days. If Moon were to be at 90°.0001 on the 9th day of a solar new year, he should be at 90°.0001 minus 102°.005 i.e., 347°.9952 at 5 p.m. on the particular solar new year day.

However for purpose of further investigation the solar new years in which Moon was between 347 to 349 degrees at 5 p.m. on that day have been selected from the short list.

TABLE II.4.

SHORT LIST OF SRI RAMA'S PROBABLE BIRTH YEARS.

B.C. Year	Julian Day	Commencement of Solar New Year, Month, Day and fraction of day	Titi at Sunrise on the next day	Longitude of Moon at 5 p.m.	Selected for furthe investigation
3560	421175	Feb. 11.068767	1.038	359.05	-
3579	414235	" 11.152293	0.719	355.126	-
3587	411413	" 11.082341	2.272	251.446	-
3598	407295	" 11.23602	0.402	351.202	-
3606	404373	" 11.165968	1.956	9.85	-
3625	397433	" 11.249594	1.64	5.926	-
3823	325112	" 9.015807	1.037	358.51	-
3850	315249	" 8.029382	1.257	0.094	-
3869	308309	" 8.113009	0.94	356.17	-
3877	305387	" 8.042957	2.493	14.89	-

3888	301370	"	8.196635	1.637	5.53	-
4105	222109	"	7.046474	0.73	354.01	-
4124	215170	"	7.130100	1.422	3.37	-
4143	208229	"	6.213727	0.098	346.09	-
4151	205307	"	6.143675	1.63	4.81	-
4170	199367	"	6.227302	1.32	217.21	-
4197	188505	"	6.240876	2.55	15.61	-
4387	119106	"	4.077141	0.41	349.69	-
4395	116184	"	4.001089	1.96	8.41	-
4406	112166	"	4.160768	0.1	345.73	-
4414	109244	"	4.090716	1.65	4.45	-
4422	106321	"	3.020664	2.18	9.85	-
4433	102303	"	3.174342	0.31	347.17	Yes
4441	99381	"	3.104290	1.84	5.89	-
4460	92442	"	3.187917	2.55	15.25	-
4677	13180	"	1.038004	0.97	350.77	-
4696	6241	"	1.121707	1.34	359.77	-

NOTE:

As explained earlier, the guidance for the selection of probable years for further investigation is as follows:

1. The solar new year should have commenced before sunrise i.e., 6 a.m. 0.25 day.
2. The range of titi on next day should be 0.003 to 2.859; and
3. The longitude of Moon on that day should be between 347° and 349° at 5 p.m.

ACCORDING TO THE ABOVE THE YEAR 4433 B.C., ALONE SATISFIES THE REQUIREMENTS AND HENCE IS SELECTED FOR FURTHER INVESTIGATION.

Fixing the date of birth of Sri Rama in 4433 B.C.

BY HIS GRACE, we have succeeded in discovering the year of birth of Sri Rama as 4433 B.C. In fact, the discovery shows that there is no other year between 3500 B.C., to 4700 B.C., in which Sri Rama could have been born. There is no need for any wavering. There is no other choice also on this. Just like the saying that all roads lead to Rome, all our calculations lead to the year 4433 B.C. Our next task is to fix the date of birth in this year.

We have already seen that in the year of Sri Rama's birth, both the solar and lunar new years should occur on the same day. Since the longitude of the Sun is fixed at 9°.0, obviously the birth should have taken place only on the 9th day from the solar new year day, assuming an average of 1 degree as Sun's daily motion. Likewise, the birth should have taken place on the 9th day from the lunar new year day, since the titi of Sri Rama's birth is Sukla Navami. Thus the birth date automatically gets fixed as the 9th day from the day on which the solar and lunar new years coincided. In the selected year of birth of Sri Rama, the solar and lunar new year days occurred on the 3rd February. The ninth day from this is 11th February. Thus the date of birth of Sri Rama is 11th February, 4433 B.C.

Data required to fix the time of birth of Sri Rama.

In chapter I, we have already seen that Sri Rama should have been born at 13 ghatikas after sunrise on that day. When converted, 13 ghatikas are equal to 5 hours 12 minutes. If we add the time of sunrise in local mean time to this, we will get the birth time of Sri Rama. So our next task is to find out the local mean time of the sunrise on the 11th February, 4433 B.C.

Determination of Sunrise and Sunset at Ayodhya. 26° 48′ (N) on the 11th February, 4433 B.C.

To calculate the actual time of birth we want the time of sunrise. To determine the sunrise at any place, the declination of the Sun and the latitude of the place are required. We know the latitude of Ayodhya as 26° 48′ (N). To know the declination of the Sun on that day, we require an ephemeris of the year for ready reference. But we do not have one. So we have to arrive at this by a different method.

We have seen elsewhere that the vernal equinox occurred on the 3rd February, 4433 B.C., in the year of Sri Rama's birth. This kind of vernal equinox is occuring on the 13/14th April of every year nowadays. Further, nowadays, the Sun crosses the Celestial Equator on the 21st March of every year, when the night and the day are equal. So that point in the Celestial Equator where the Sun crosses it, from south to north, is taken for reference and the distances are always measured only in one direction (not on both sides from the point)

i.e., eastward and complete the circle of 360 degrees. So the Sun may be at 10° or 20° etc., from this point. This measurement is called the Right Ascension. This phenomena was the same for the ancient times also. Only the date of occurrence varies from time to time. The movement of the Sun from the day it crosses the Celestial Equator and the date of occurrence of the Vernal Equinox must be the same in the remote past and now. Likewise the movement of the Sun in its ecliptic path from the date of vernal equinox, will be the same between the past and now. The Sun will move to his 9th degree of longitude on the 23rd or 24th April every year now. A reference to any modern ephemeris would show that the Sun attains its declination of about 12° 20′ average, every year. This average has been arrived at after calculating from the declinations of the Sun taken from the Raphael's Ephemeris for a number of years. This average declination of 12° 25 will be near to the declination of the Sun on the 11th February, 4433 B.C., the day of birth of Sri Rama.

Having fixed the declination of the Sun as 12° 25′ on the 11th February 4433 B.C., let us now apply a modern method to determine the sunrise and sunset timing on that day.

Log Sin Ascensional Difference = Log Tan Declination of Sun + Log Tan latitude of place

Substituting the above with relevant figures, we have

Log Sin Ascentional Difference = Log Tan 12° 25′ + Log Tan 26° 48′

= 9.3428 + 9.7034 = Sin 6° 23′

As the declination is north add this to 90°. We get 96° 23′

Converting this into hours, minutes and seconds we get 6 hrs. 26 min. So local apparent time of Sun setting is 6 hrs. 26min. p.m.

This subtracted from 12 hours gives the time of sunrise as 5 hrs. 33 min. 48 secs. a.m.

So the apparent Local Mean Time of sunrise on the 11th February 4433 B.C. is 5 hrs. 33 min. 48 secs.

To get the Local Mean Time, we have to add the Equation of Time of 2 minutes (obtained from the Tables of Equation of Time found in the book A Manual of Hindu Astrology' by B.V.Raman, to the apparent time of sunrise and sunset.

Adding 2 minutes we get the following results.
Local Mean Time of Sunrise: 5 hours, 35 min. 48 secs. a.m.
Local Mean Time of Sunset: 6 hours, 28 min. 48 secs p.m.

To fix the time of birth of Sri Rama on the 11th February, 4433 B.C.

Time of birth of Sri Rama in ghatikas after sunrise;	13
Equivalent of 13 ghatikas:	5h. 12m.
Sunrise on the 11th February 4433 B.C.	5h. 35m. 48s.
Adding the above two items	10h. 47m. 48s.

So the birth time of Sri Rama on the 11th February, 4433 B.C. is 10 hours, 47 minutes, 48 seconds a.m.

To fix the week day of Sri Rama's birth:

Having successfully fixed the date of birth of Sri Rama as the 11th February, 4433 B.C., it is simple to calculate the week day. But before that, let us discuss Ramayana and the week day in another context.

One conspicuous aspect observed in the close and critical study of Valmiki Ramayana is that the poet has not made any kind of reference at all about the week day, anywhere in his entire epic, though he has made several references about the other units like, day, night, month, year, ruthu, titi, nakshatra etc., in the following instances or slokas.

Bala Kanda:	13.1; 15.20; 14.1; 18.8; 19.18; 22.22; 23.17; 26.22; 34; 29.32; 30.5; 47.20; 69.7; 12; 34.14; 35.1, 6; 45.5; 46.6. 12, 16; 47.1; 49.1; 50.47; 52.1; 54.1, 35; 56.1; 57.5; 59.7; 63.4; 65.1, 36; 66.1; 68.1, 21; 69.1; 70.1; 71.23; 72.13, 21; 73.7, 8; 74.1;
Ayodhya Kanda	3.4, 15, 16, 41; 4.2, 21; 67.2; 67.1; 69.1; 71.18; 83.23; 84.18; 89.1; 90.23; 105.1;
Aranya Kanda	2.1; 8.1; 11.5; 11.25, 28; 11.70;
Kishkinda Kanda	1.22, 41, 92; 26.13, 16; 27.39, 44; 28.54; 30.78; 32.14; 33.45; 40.70; 47.9; 53.2, 15, 18, 21, 22; 53.26; 67.25; 58.5; 64.14;

Sundara Kanda	4.2, 4; 22.8; 31.12; 33.18, 33; 37.8, 36, 67; 39.20; 40.10; 58.47; 58.51; 58.47; 58.51, 69, 106; 65.24;
Yudha Kanda	4.6; 17.1; 21.11; 22.68/72; 25.24, 26; 31.22; 38.3, 18; 44.1, 17, 26; 57.3; 74.7, 40; 75.4, 26, 41, 50; 92.6, 8, 16; 93.68; 94.5, 8; 124.1; 124.1, 17; 128.22; 129.14, 53; 131.9, 50;

(figures before the stop indicates the sarga and figures between stop and semi-colon indicate the sloka numbers from M.L.J. edition)

Naturally a question arises as to what could be the reason for this conspicuous omission? One obvious explanation could be that the system of reckoning a day by a week day might have not been in existence during that age. The system of naming the week days by the planets could have been introduced in Bharath only subsequently. There is a section of scholars who opine that reference to week days commenced from Varaha Mihira by about 400 A.D. As to the exact period of its introduction in India, it is a historical question, requiring deep study.

A few commentators claim that Valmiki has referred to a week day and in support the following sloka in Ayodhya Kanda, Sarga 26, Sloka 9 is quoted. अद्य बार्हस्पतः श्रीमानुक्तः पुष्यो नु राघव

"Oh Rama, today is Thursday with Pushya nakshatra."

This is how they interpret the meaning of the above sloka. They claim that Brahaspatha Sreeman indicates Thursday and Pushya indicates the nakshatra of the day. It may be interesting to note here, that this is the only sloka that these commentators quote in support of their claim.

It is beyond one's imagination that when the system of reckoning a day by a week day was in existence during the days of Valmiki, he would have referred to it only on a solitary occasion. But a close and critical study of the construction of the words in the above sloka would reveal that Barhaspatha is used as an epithet of Pushya nakshatra, since Brihaspathy is the deity of Pushya. It is a habit of Valmiki to

use an epithet invariably on all occasions. So the interpretations of a few commentators that Brahaspatha means Thursday does not appeal to us for acceptance.

Saint Purandara Dasa has made a reference regarding the week day of the birth of Sri Rama and says that it is Wednesday. This could be by his divine intuition. This could not have been by a direct reference to Valmiki Ramayana. As far as Ramayana is concerned, Valmiki is the only authority since he composed the epic first.

It is highly appreciable indeed, to recapitulate now that so far we have depended on the internal evidence only for establishing or substantiating any point or seeking information. Since this is a proper step in the right direction, let us follow the same principle without any kind of departure.

The name of the week day is essential and would be beneficial for a close and critical study of Sri Rama's horoscope. It is also important for assessing the strength of the shad bala, when we come to calculate it. The planet as the lord of the day of birth is assigned a value of 45 shashtiamsas as his varabala.

Modern astronomy gives us a method to find out the week day.

This method is adopted from the article which appeared in the Astrological Magazine, July, 1969; vol. 58, No. 7, page 700. The same is used to calculate the week day of Sri Rama's birth.

To find out the week day of Sri Rama's birth:

Date of birth of Sri Rama: 11th February, 4433 B.C.
Deducting the year 4433 B.C. from the standard 4713 B.C., we get 280.

Multiplying 280 by 365 days, we get 102200
Integral part of $\frac{280+3}{4}$ = 70 and when added, we get 102270

No. of days up to the 11th February, 4433 B.C.

Excluding the 1st January = 41 days and when added, we get 102311. Dividing 102311 by 7 we get a quotient of 14615 and remainder of 6. Counting the remainder 6, from Tuesday, we get Sunday. So Sunday is the week day of Sri Rama's birth.

Summary:

Thus far, we have succeeded in finding out the following data.

1. The year of Sri Rama's birth.
2. The date of His birth.
3. The time of His birth.
4. The week day of His birth.

We are yet to find out the longitudes of the planets Budha, Rahu and Ketu to complete the collection of all the basic data required for a complete study on the astrological aspects. There appears to be no way of getting these direct from the epic. So we have to resort to some other method quite suitable and satisfactory for our purpose. One method is to devise a suitable and acceptable formula to calculate the longitudes of the planets for the remote past period.

Calculate by that formula the longitudes of the planets Kuja, Guru, Sukra and Sani. Compare these results with the longitudes already arrived at in Chapter I for these four planets directly from the epic itself, correct to the second. If the difference between them is a few degrees either side, they may be ignored in view of the remoteness of the period and taken as correct. If the results are very near or correct to the minute of the already arrived longitudes, we can then take it that the formula devised is proper for adoption.

Apply the same formula and calculate the longitudes of Budha, Rahu and Ketu. Then these results are bound to be correct and can be confidently adopted, with the same status for the results as that of the other planets, Kuja, Guru, Sukra and Sani.

So our next task is to develop a method and formula to calculate the longitudes of the planets for the 11th February, 4433 B.C.

No gift should be made to any one with disrespect or even with irreverence

Balakanda - Chapter 13
Verse 32

CHAPTER III

DEVELOPMENT OF METHOD OF CALCULATIONS OF LONGITUDES AND LATITUDES.

Objective:

Having successfully found out the year, date and time of birth of Sri Rama, our next task is to find out a method to calculate the longitudes of the planets Kuja, Guru, Sukra and Sani on the 11th February, 4433 B.C.,

A word in clarification:

One may think that the exercise done in Chapter I is an ntellectual play upon the captivating web of words of Valmiki and cannot by itself, without other corroborating evidence, be treated as acceptable. To satisfy this type of thinker, a necessity to bring in an external tool of modern astronomy to calculate the longitudes of the planets at the time of Sri Rama's birth, arises. Definitely it is not the intention to prove what Valmiki has given is true. If it is done so, it will be akin to show disrespect to the great poet.

Systems in vogue:

In India there are two well-known systems, one based on fixed and the other on moving zodiac, i.e., Nirayana and Sayana or tropical. They are known as vakya sidhanta and drik ganitha sidhanta.

Vakya Sidhanta:

In this system the results are obtained straight in nirayana. The formulae adopted are traditional. In many parts of India, panchangams are cast as per this method, popularly known as vakya panchangams. Mostly the results do not tally with the actual positions of the planets as observed in the modern laboratories. There are differences in the durations of titis, nakshatras, etc., from the results given by the other method i.e., drik ganitha method.

Drik Ganitha Method:

In this method the longitudes of the planets are calculated first by the sayana system, which tally well with the positions of the planets observed by modern laboratories. Ayanamsa is then applied to the sayana longitudes to get the corresponding Nirayana longitudes. This system is in vogue in India for the last six or seven decades. This system is having wider acceptance and consequently the other system is getting obsolete.

Now the question is which system was being followed during the period of Rama. The vakya system might have been followed since a few centuries ago. It need not have been followed at that time. They might have followed a more scientific and sophisticated method. Let us look into this aspect deeper.

Critical Study of the epic:

A critical and investigating study of Valmiki Ramayana gives enough and convincing clues and indications that during the time of Rama, the Hindus had technological superiority not only in astronomy but also in many other disciplines like science, medicine, surgery, machinery, flying devices, communications, space travel, satellite launching pads, sophisticated weapons like missiles etc., as compared to the advanced modern world. In fact every technological advancement in the present century only goes to show how believable it is that such superiority existed beyond mythology in that age. in fact, the modern advancement in the present century underlines the possibilities of the existence of these advancements. Our ancestors of two to three centuries ago would not have been able to visualise the existence of the flying vimanas during the period of Rama, as we do now.

Vimanas in Ramayana:

We have some descriptions of vimanas like Pushpaka Vimana in Ramayana. It shows that they had the know-how to construct and operate such vimanas. What type of know-how they had, is beyond our imagination now. Perhaps their know-how might have been superior to ours. Superior because the Pushpaka Vimana, as described in the epic, was having capabilities of manoeuvering, load capacity

etc., better than the present day most sophisticated jet planes. For instance, Pushpaka Vimana can carry a pay load of one or two passengers, as in the case of Sita having been taken by someone, to the battle front to show the condition of Sri Rama in an unconscious condition. This shows that it can fly low also. The same vimana was able to transport not only Sri Rama, Sita, Sri Lakshmana, Vibhishna but also the entire vanara army from Sri Lanka and their womenfolk from Kishkinda to Ayodhya. Their number must definitely be in thousands. Compare it with our most sophisticated airships. They can carry at the most less than a thousand. Further, these air-ships have got to be properly balanced by make-shift arrangements for light and heavy loads. People of Rama's time must have mastered the technique of balancing the pay load. Such is the internal evidence available in the epic on their most complex and sophisticated aeronautical designing of their vimanas. But if we search for some external evidence, we can refer to the paper presented by an Italian Scientist Dr. Roberto Pinotti during the world Space Conference held in Bangalore in October 1988. His paper on air space technology appeared in the Hindu on the 12th October 1988. The following is an extract.

"India had a superior civilisation:

India may have had a superior civilisation with possible contacts with extra-terrestrial visitors, and the flying devices called 'Vimanas' described in ancient Indian texts may underline their possible connections with today's aerospace technology, an Italian scientist told the World Space Conference here today. Dr. Roberto Pinotti asked the delegates to examine in detail the Hindu texts instead of dismissing 'all the Vimana descriptions and traditions as mere myth'.

The importance of such studies and investigations may appear incredible now because the existence of flying devices beyond mythology can only be explained with a forgotten superior civilisation on earth, he said.

Pointing out that Indian Gods and heroes fought in the skies using piloted vehicles with terrible weapons, Dr. Pinotti said they were similar to modern jet-propelled flying devices.

Thirty-two secrets:

He said certain descriptions of the vimanas seemed 'too detailed and technical in nature' to be labelled as myth. He cited various texts to show there were 32 secrets relating to the operation of vimanas some of which could be compared to modern day use of radar, solar energy and photography.

Quoting from 'Vymanika Shastra' he said the ancient flying devices of India were made from special heat absorbing metals named 'Somaka Sounda lika and Mourthwika'.

He said that the text also discussed the seven kinds of mirror and lenses installed aboard for defensive and offensive uses. The so called 'Pinjula Mirror' offered a sort of 'visual shield' preventing the pilots from being blinded by 'evil eyes' and the weapon 'Marika' used to shoot enemy aircraft 'does not seem too different from what we today call laser technology' he said.

According to the Italian expert, 'the principles of propulsion as far as the descriptions were concerned, might be defined as electrical and chemical energy was also involved.

For instance, the 'Tripura Vimana' mentioned in 'Vymanika Shastra' was a large craft operated by 'motive power generated by solar rays. Dr. Pinotti said, adding 'its elongated form was surely much closer to that of a modern blimp'.

Sophisticated Design:

According to Dr. Pinotti, the huge 'Shakuna Vimana described in the text 'might be defined as a cross between a plane and a rocket of our times and its design might remind one of today's space shuttle.'

'Surely, it expresses the most complex and sophisticated aeronautical designs among all the other descriptions of Vimanas mentioned in the 'Vymanika Shastra' he said. He described the author of the treatise 'Vymanika Shastra' as a man 'attempting to explain an advanced technology.'

Dr. Pinotti, who has made an exhaustive study of the history of Indian astronautics, said another text, 'Samarangana

Sustradhars' had 230 stanzas devoted to the principles of building Vimanas and their use in peace and war.

He said ancient aryans knew the use of the element 'fire' as could be seen from their 'Astra' weapons that included Soposamhara (a flame belching missile), Prasvapona (which caused sleep) and four kinds of Agni Astras that travelled in sheets of flame and produced thunder.

He said the car that was supposed to go up to Suryamandal (solar system) can not be dismissed as a myth because of the 'technical nature' of its description.

Dr. Pinotti said depictions of space travel, total destruction by incredible weapons and the fact that Vimanas resembled modern unidentified flying objects would suggest India had a superior but forgotten civilisation.'

In the light of this, we think it will be better to examine the Hindu texts' and subject the descriptive models of Vimanas to more scientific scrutiny,' he said. - PTI".

These are the findings on the superiority of the ancient Hindus as revealed by the texts in India and presented before the scientists drawn from all over the world in a seminar, by a neutral foreigner. No reader can brush aside these as nothing. Something is there in our texts for the modern civilised world to probe more in depth and dig out more knowledge that is yet to be brought to surface.

The period of Rama can maintain the title of superiority if it is consistent with other similar disciplines of organised knowledge, and if it dovetails with them to give a consistent pattern of knowledge similar to the flying devices like vimanas. Science, medicine, surgery, machinery, satellites and their launching, communications, etc., are some of the other disciplines worth critical examination. Let us now look into these a bit closer.

Medicine:

In the field of medicine, people of that age had masterly control over the use of herbs. When the princes and a few vanaras lost consciousness in the battle field due to a missile of Indrajit, the right

herb was identified and brought in time to the site of victims. All those who lost consciousness regained it quickly.

Surgery:

In surgery, too, they attained supremacy. In the sloka 6, sarga 28, Sundara Kanda. Sita says.

नूनं ममाङ्गान्यचिराद्नार्यः शस्त्रैः शितैश्छेत्स्यति राक्षसेन्द्रः ।
तस्मिन्ननागच्छति लोकनाथे गर्भस्थजन्तोरिव शल्यकृन्तः ॥

"If my Lord Rama does not arrive in time to extricate me from this situation, like an unborn creature or child is extricated from the womb by surgery शल्यकृन्तः (salyakrintaha means by dictionary 'extraction of thorns, splinters or that part of surgery which relates to the extraction of extraneous matter from the body') surely and quickly, the king of rakshasas, Ravana, will out off my limbs by sharp instruments."

This is like the present day Caesarian surgery. By the employment of this simile, the poet has achieved another important purpose of communicating to the readers of his epic in later years, centuries and yugas, the message that the field of surgery during his time was supreme.

Engineering:

In the field of engineering, Valmiki has made a reference to machineries in sloka 33, sarga 61, Yudha Kanda एतत् समुच्छ्रितं यन्त्रं

"this is a gigantic machine".

This is said in comparing Kumbakarna to a machine and clearly indicates that in that age machinery was not only in vogue but also well known to the common man. There are one or two other instances in which Valmiki has used a simile referring to rotating wheels etc.

Satellites:

In Ramayana, the descriptions of the ashrams of great sages like Agastya,. Vasishta, Bharadwaja, Viswamitra, etc., indicate that the excellent infrastructure that was available is beyond the imagination of our present civilisation. There was a shuttle launching pad, perhaps, similar to the one in Houston, USA. Sage Viswamitra was able to send Trisanku to the outer space, similar to sending manned space shuttles now. Viswamitra was able to communicate and hold dialogues with celestial inhabitants. Indra was able to stop Trisanku from

proceeding further. This reminds us about the present day star-war. Finally Trisanku was made to orbit the universe just like the present day satellites.

We know now that solar energy is necessary for a satellite. It must have been necessary also for Trisanku's satellite. This proves that the solar energy technique was very well known at that time.

Communication:

In the field of communications, there are a few instances where Valmiki had made some references to them.

To quote one instance of their supremacy in communication, Sri Rama left Ayodhya by about noon on Sunday the 16th February, 4409 B.C., i.e., Kara, Chaitra Sukla Dasami titi, Pushya Nakshatra on exile. Sri Rama instructed the charioteer to run the chariot very fast. He reached Sringeripura, Guha's place before dusk. But when he met Guha, Guha said that he already knew the overnight developments. He knew about the sudden departure of Sri Rama on exile by about noon. In fact, he was expecting the arrival of Sri Rama to his place.

Sri Rama was going by the fastest available mode of transport. Before he could reach Guhas's place, Guha had already received the message and was preparing to receive Sri Rama.

Such was the quick communication available in that age. The author has identified a few more disciplines in which such supremacy is indicated; but it is not the intention of the author to write here another treatise within a treatise. Our objective now is to find out whether supremacy was there in that age in scientific knowledge.

In the astronomical and astrological fields also, indications are there, in Valmiki Ramayana, that the Hindus had superior knowledge as compared to our present race in this modern world. Their superiority would get well established beyond doubt if we calculate by a modern method and compare them with what has been handed over so gloriously by the Sage Valmiki to his posterity, i.e., the longitude of Kuja, Guru, Sukra and Sani. The modern methods take into account various major corrections as well as innumerable minor corrections due to perturbing causes. Nautical Almanac, Greenwich,

is the accepted international authority to have developed the most advanced astronomical techniques and necessary formulae for calculating the tropical longitudes of the planets, to a very great degree of accuracy required for researching astrologers, for whom such information is very vital and which information is otherwise difficult to obtain from any other source.

Brief description of method.

The position of a point on a sphere is defined with reference to two factors called co-ordinates; similarly the position of a point on a heavenly body in the celestial sphere is fixed with reference to two co-ordinates. In Hindu Astronomy and European Astronomy these two co-ordinates are called longitude and latitude. European or modern astronomy reckons longitude from a point (called the first point of Aries) which is one of the two points of intersection of the Celestial Equator with the Ecliptic. These two points are called Vernal and Autumnal Equinoxes. The European or modern longitude is called Celestial Longitude and the European or modern latitude is called Celestial Latitude.

Celestial Longitude of a body or a point is the arc of the ecliptic intercepted between the First point of Aries and a great circle passing through the poles of the ecliptic and the body or the point. This great circle is called a "Secondary to the Ecliptic". The Celestial Latitude of the body or the point is the arc (of the great circle passing through the poles of the ecliptic and the body or the point) intercepted between the ecliptic and the body or point i.e., in other words the celestial latitude is the arc of the secondary to the ecliptic intercepted between the ecliptic and the body or the point. The First point of Aries referred to above is moving from east to west and this movement is called the phenomenon of the precession of the Equinoxes or briefly 'precession'.

The European celestial longitude is now measured eastwards from the First Point of Aries, reckoning from 0° to 360°. The European Celestial latitude is measured from the ecliptic towards the poles of the ecliptic along the secondary to the ecliptic passing through the body or point, and is reckoned from 0° to 90.°

The European celestial latitude is northern or southern (i.e., positive or negative) according as it is measured from the ecliptic

towards the north pole of the ecliptic or south pole of the ecliptic. As the first point of Aries is moving, the European first point of longitude-reckoning is said to be movable point or in other words, the European beginning point of celestial longitude is said to be a "moving point".

The European sources mentioned above enable the calculation of the European celestial longitude from the vernal Equinox, which is called the "First Point of Aries". The European celestial longitude which is reckoned from the fixed first point of the constellational zodiac or the "first point of Mesham" is usually called Nirayana longitude. The distance (i.e., the angular distance along the ecliptic) between the "first point of Mesham" and "the First point of Aries" is usually called Ayanamsa. The tropical longitude is called Sayana longitude and the Indian longitude measured from the fixed "First point of Mesham" is called Nirayana longitude. So the difference between the Tropical longitude (i.e., Sayana longitude) and Nirayana longitude is called Ayanamsa.

Plan of action:

The formulae developed by Nautical Almanac has been reproduced by late C.G.Rajan in his wonderful book on the calculation of planetary positions for 6300 years. Unfortunately this book is out of print now, but the author of this book possesses one for the last five decades. The original formulae as adopted by C.G.Rajan in his book is furnished under Section 1 of each planet in Chapter V. C.G.Rajan has developed Tables and given the longitudes etc., only up to 3200 B.C. But we require these for earlier periods also. With the help of the formulae given by C.G.Rajan, the author has prepared the longitudes, latitudes etc., up to 5000 B.C. These are furnished in Table 1 of the respective planets in Chapter V.

Our objective is to calculate the longitudes of planets on the day of Sri Rama's birth and the source is the formulae of the Nautical Almanac. Making use of these, we can achieve our objective.
To achieve the objective, the plan of action, in brief, is as follows:

Kuja, Budha, Guru, Sukra and Sani:

In calculating the Nirayana longitudes of the above five planets, the following procedure is adopted according to the practice of modern astronomy.

First, the heliocentric longitudes and latitudes of the planets are calculated as per Nautical Almanac, Greenwich.

Next, the geocentric longitudes and latitudes are also calculated, as per Nautical Almanac, Greenwich.

Finally Ayanamsa is applied to get the Nirayana longitude.

Explanation:

Heliocentric longitude of a planet means the longitude of a planet as seen from the centre of the Sun.

Heliocentric latitude of a planet means the latitude of the planet as seen from the centre of the Sun.

Geocentric longitude of a planet is with reference to the centre of Earth i.e., as seen from the centre of Earth.

Geocentric latitude of a planet means the latitude of the planet as seen from the centre of the Earth.

As the Sun is the centre of the Solar system, the longitude and latitude of a planet are first found for the sake of accuracy with reference to the Sun and then they are converted into longitude and latitude with reference to the Earth.

For our mundane purposes (including astronomical and astrological purposes), we require geocentric longitudes and geocentric latitudes of planets.

The geocentric longitudes obtained as above are as per Sayana System. i.e., Tropical System. To convert this into Nirayana System, we require Ayanamsa.

To find the geocentric longitude and latitude of a planet from its heliocentric longitude and latitude:

Let S be the longitude of Sun,
Let R be the radius vector of the Sun,
Let H be the heliocentric longitude of a planet,
Let b be the heliocentric latitude of the planet,
Let r be the radius vector of the planet,
Let x be the geocentric longitude,
Let y be the geocentric, latitude.

N.B. Northern latitude is positive, Southern latitude is negative (both Heliocentric and Geocentric)

$$\text{then } \tan P = \frac{r \text{ Cos b. Sin (H-S)}}{R + r \text{ Cos.b. Cos (H-S)}} = \frac{V}{W} \text{ (say)} = \tan a.$$

— Formula 1

Here r Cos b. Sin (H-S) = V

R + r Cos b. Cos (H-S) = W

If V is positive and w is positive, then P = a

If V is positive and W is negative, then P = 180° − a

If V is negative and W is negative, then P = 180° + a

If V is negative and W is positive, then P = 360° − a.

The geocentric longitude x = S + P. — Formula 2

Latitude:

If y is geocentric latitude,

$$\tan y = \frac{r \text{ Sin b. Sin P}}{R + r \text{ Cos.b. Sin (H-S)}} = \frac{C}{V}$$

— Formula 3

$$\tan y = \frac{r \text{ Sin b. Cos P}}{R + r \text{ Cos.b. Cos (H-S)}} = \frac{D}{V}$$

— Formula 4

The formula 3 is used when P is near 90° or 270°
i.e., when P is between 45° and 135° or 225° and 315°

The formula 4 is used when P is near 0° or 360°
i.e., when P is between 315° and 45° or 135° and 225°

If C and V are both positive or both negative the latitude is Northern.

If D and W are both positive or both negative, the latitude Y is Northern.

If in C and V, one is positive and the other is negative, the latitude Y is Southern.

If in D and W, one is positive and the other is Negative, the latitude Y is Southern.

If S,R,H,b,r are known (or given) then χ and y can be found from the four formulae given, i.e., if we want to find the geocentric longitude and latitude of a planet for a required time, we must first find out S, the longitude of Sun and R, Radius vector of the Sun for the required time.

N.B.: Figures in degrees represent the remainder in degrees after dividing by 360° and leaving out the integer.

Father is our master; nay, he is our supreme deity. He alone will be our husband, to whom father will give us away.

Balakanda - Canto 33
Verse 21

In case, however, of virtuous women, who are in fact devoted to good conduct, truthfulness and the precepts of their elders and keep within the bounds of decorum their husband is the most sacred object and he above excells all

Ayodhya Kanda - Canto 39 - Verse 24

Swans full of joy descend into rivers from which mud has altogether disappeared which are now fringed with sands whose waters have become clear which are frequented by herds of cows and flocked with cranes and are rendered noisy with their cries.

Kishkinda Kanda - Canto 30 - Verse 42

CHAPTER IV

AYANAMSA.

AYANAMSA is required to convert Tropical(Sayana) Longitude into Siderial (Nirayaṇa) Longitude. Since over a century ago, Indian astrologers have started to employ European Almanacs for the preparation of Hindu almanac called Drig-Ganitha Panchang for astrological purposes, since European Almanacs give accurately the longitudes of planets according to the Sayana System . If the ayanamsa quantity is correctly known, the Nirayana longitude, that is required for Nirayana system, can be easily obtained by subtracting or adding the Ayanamsa quantity from or to the Sayana longitude. Since we have proposed to find the longitudes of the planets in the Sayana system first and then convert them into the Nirayana system, we must know the Ayanamsa. In our present case, it has become easy to know whether the ayanamsa we have arrived at after some calculations according to Vedanga Jyotisha is correct. Valmiki has already given the Nirayana longitudes of all the planets except Budha correct to the second. Therefore when we calculate the Sayana longitudes and apply this ayanamsa the results must tally with the longitudes given by Valmiki. If they tally correct to the degree, we can take it that the ayanamsa calculated and adapted is correct.

Calculation of Ayanamsa according to Vedanga Jyotisha:

According to Vedanga Jyotisha

> "the Winter Solstice was in the beginning of Sravishta (divisional). The first year of the cycle commenced with the Winter Solstice when the Sun and the Moon were together at the beginning of Dhanishta and the Uttarayana also began at the same time".

(Vide page 38 of the "the Orion" by the late Bala Gangadara Tilak).

The beginning of Sravishtha or Danishta (Tamil Avittam) is identified with Alpha Delphini. The right ascension and declination of Alpha Delphini were 20hrs. 36min. 9secs. of time and 15° 38′41″ of arc North respectively on 13.4.1925 and so tropical longitude of the star becomes 316° 20′.

The beginning of Dhanishtha is 293° 20′ according to the Indian Siderial longitude. As the Winter Solstice (i.e.,270° tropical longitude) is said to have coincided with beginning of Dhanishtha which is 293° 20′ (of the Indian Siderial longitude) it is clear that the European First Point of Aries or the European starting point (or the zero degree of Sayana System) was 23° 20′ (i.e., 293° 20′ minus 270°) to the east of the Indian starting point or the beginning of Mesham (or the zero degree of Nirayana System). At the present times, the European First Point of Aries is decidedly to the west of the Indian starting point. In 1925 A.D., the tropical longitude of the beginning of Danishtha or Alpha Delphini was 316° 20′ and the tropical longitude of this star was 270° 0′ in the Vedanga Period. Thus since the Vedanga period, this star has increased in its longitude by 46° 20′ (i.e., 316° 20′ minus 270° 0′). This increase is due to the westward motion of the European starting point and to the very small eastward motion of the star. Taking the annual proper motion of this star to be almost uniform and equal to +0.0705 seconds of arc (i.e., +0.0047 seconds of time) and taking the rate of the European starting point (or the precession of the equinoxes as it is called) to be 50″.2564 + 0″.0002225 t where t is the number of years from 0 day, 1900 A.D., and is positive after 1900 A.D., and negative before 1900 A.D., we shall find out the period during which this increase of 46° 20′ has occurred i.e., in other words, we shall find out the time when the winter Solstice coincided with Alpha Delphini.

The rate of precession for 1900 A.D.

$$= 50''.2564 + 0''.000225\ t.$$

Therefore, the precession for 1925 A.D.

$$= 50''.2564 + 0''.0002225 \times 25$$
$$= 50''.26196.$$

So the rate of precession for 1925 A.D.

$$= 50''.26196 + 0''.0002225 \times n$$

where n is reckoned from 1925 A.D., and is positive for years after 1925 A.D., and negative before 1925 A.D.

The increase of 46° 20′ is due to the accumulated sum of the precessions for the several years before 1925 A.D., and to the accumulated sum of the annual proper motion of the star for the same number of years before 1925 A.D. Let the number of years be n.

The annual proper motion of the star is 0″.0705.

Then 46° 20′ = (50″ .26196 - 0″.0002225n) to n terms (1) + 0″.0705 to n terms (2).

= (50″ .26196 - 0″.0002225n) to n terms (1) + 0″.0705n (2).

Now combining (1) and (2) we have,
46° 20′ = the sum of (50″.33246 - 0″.0002225n) n terms,
where 50″.33246 = 50″.26196 + 0″.0705.

Now the sum of (50″.33246 - 0″.0002225n) to n terms is the sum S of an arithmetical series, the 1st term a of which is 50″.3322375 i.e., 50.33246 - 0.0002225 and the common difference d is -0.0002225. The formula for the sum of an arithmetical series is

$S = \frac{n}{2}[2a + (n-1) d]$ or $S = \frac{n}{2}(a+l)$ where S is the sum, n is the number of terms, a is the 1st term of the series, d is the common difference between any two consecutive terms and l the last or the nth term. Here a = 50″.3322375 and d = -0″.0002225.

Therefore, 46° 20′ = S = n/2 (2 × 50″.3322375 − (n − 1) 0″.0002225)
Therefore, 46° 20′ = 50″.332375 n − n(n − 1) 0″.00011125.
Therefore, 46° 20′ = 50″.33234875n − 0″.00011125 n.
But 46° 20′ = 166800 secs. So by transposition we have,
$0''.00011125n^2 - 50''.33234875n + 166800 = 0$
This is a quadratic equation and n will have two values.
In a quadratic equation of the form $an^2 + bn + c = 0$

$$n = \frac{-b \pm \text{root of } (b^2 - 4ac)}{2a}$$

$$= \frac{-(-50''.33234875) \pm \text{root of } [(50.33234875)^2 - (4 \times 0.00011125 \times 166800)]}{2 \times 0.00011125}$$

$$\text{Therefore, } n = \frac{50.33234875 \pm 49.589}{0.0002225}$$

$$= \frac{0.74334875 \text{ or } 99.92134875}{0.0002225}$$

Therefore, n = 3339 or 449084.

So taking 3339 we have n = 3339 i.e., the number of years required is 3339 years from 1925 backwards.

So the coincidence of the Winter Solstice with Alpha Delphini took place in 3339 years before 1925 A.D. i.e., 1414 B.C. (i.e., 3339 - 1925). So in 1414 B.C., the European Starting Point was 23° 20′ (i.e., 293° 20′ minus 270° 0′) to the east of the Indian starting point or in other words the ayanamsa in 1414 B.C., was -23° 20′ and the winter Solstice coincided with Alpha Delphine or the beginning of Dhanishtha in about 1414 B.C.

Calculation of Ayanamsa for 4433 B.C.

Now, we shall calculate the Ayanamsa in 4433 B.C., which is the year of Sri Rama's birth.

(a) We require for this the year of Soonya Ayanamsa or zero Ayanamsa or when did the coincidence of the European Starting Point and the Indian Starting Point take place.

Now, the ayanamsa for 1925 is 22° 56′ 4″.61 and the rate of precession in 1925 is 50″.26196 ± 0.0002225n, where n is the number of years from 1925 and is positive after 1925 and negative before 1925. Let the year of coincidence be n years before 1925; then we have,

$22° \, 56' \, 4''.61 = n/2 \, [2a + (n-1) \, d]$ where $a = 50''.26173751$, $d = -0''.0002225$

Therefore, $22° \, 56' \, 5''$ (nearly)

$$= n/2 \, [2 \times 50.2617375 - (n-1) \, 0.0002225]$$

″ $82565 = 50.26184875n - 0.00011125n^2 + 0.00011125n.$

″ $0.00011125n^2 - 50.26184875n + 82565 = 0$

So applying the formula as before, we get,

$$n = \frac{50.26184875 \pm \text{root of}[(-50.26184875)^2 + 4 \times 0.00011125 \times 82565]}{2 \times 0.00011125}$$

$$n = \frac{50.26184875 \pm 49.896}{0.0002225}$$

Taking $n = \dfrac{50.26184875 - 49.896}{0.0002225}$, we have $n = 1644$ nearly.

Therefore, the coincidence took place 1644 years before 1925 i.e., 281 A.D. So the year of Soonya Ayanamsa is 281 A.D.

Subtracting one cycle	1644 years
	1363 B.C. Ayanamsa is 22° 56′ 4″.61
Subtracting another cycle	3007 years - Ayanamsa is 0
Subtracting another cycle	4651 years - Ayanamsa is again 22° 56′ 4″.61
Required year	4433 B.C.
Difference	218 years.

The general equation for ayanamsa for any year is,

$22° 56' 4''.61 \pm n/2 [2a + (n-1) d]$ where n is the number of years from 1925 A.D.., a 50″.2621825.

Substituting the above values,

$$22°.934614 - \frac{218}{2} + [2x50.26211825 + 217x0.0002225]x\frac{1}{3600}$$

$$22°.934614 - 3°.0450946 = 19°.891045$$

As the year 4433 B.C. falls within the 1st quadrant, the movement is to east and so the Ayanamsa 19.89105 is to be added to the Sayana longitude. This Ayanamsa is arrived at by the Libratory theory, where the motion is not continuous but oscillating, leaving alone any controversy about the scientific character of this in modern times.

Let us now consider the other views on Ayanamsa of Precession, which support the Libratory theory and calculate our required Ayanamsa for 4433 B.C., which is the year of birth of Sri Rama.

During a symposium on the vexed question of "Ayanamsa" or "Precession of the equinoxes", Sri L. Narayana Rao has presented a paper bearing No. 10. This is published in pages 221 to 225 in the Astrological magazine of Feburary 1963 issue. The following is an extract for the ready reference of the readers.

"Surya Sidhanta":- At the time of creation and also at the commencement of a Mahayuga the intersectional line of

equinoxes of the equatorial and ecliptic circles occupies the zero position or conversely the first point of Aries of the moving zodiac coincides with the first point of the fixed zodiac or Nirayana Meshadi. Then it traces 27° to the east in 1800 years, then retraces by gradual decrease reaching the zero position in the next 1800 years, then it goes behind 27° in the west decreasing algebraically in 1800 years and again increasing from −27° to 0, in the last phase of 1800 years. Thus in the course of 7200 years 108° is traced by the equinoctial line and in a Mahayuga this repeats 600 times.

Formula 1

Multiply the number of days elapsed in Mahayuga by 600 and divide it by the number of days in a Mahayuga. The quotient will be revolutions; reduce the balance to signs, degrees, minutes and seconds. Find the Sine argument thereof. Multiply this by 3 and divide by 10 which is 108/360. This will be the amount of precession for any year. For 600 revolutions = 4320000 years (a Mahayuga).

1 revolution = 7200 years.

We want for 1962 commencement of the Hindu Solar year. Kali year = 1962 − 78 + 3179 = 5063.

Previous yuga's total being a multiple of 7200 they are of no use; we may take 1800 for each quarter. We are thus left with
5063 − 2 (1800) and we get remaining 1463.

$$\text{Angle traced} = \frac{90 \times 1463}{1800} = 73^\circ.15$$

being less than 90 the Sine argument is itself:
Multipling this by 3 and dividing by 10 we get

$$\frac{73.15 \times 3}{10} = 21.945 = 21^\circ\ 56'\ 42''.$$

As two quadrants of 90° each have passed, we are in the 3rd quadrant, i.e., receding from 0° to −27°, the amount of precession is negative, i.e., the first point of Aries has moved behind the first point of Aries of the fixed zodiac by 21° 56′ 42″.

This is the Libratory theory There is lot of controversy about the scientific character of this but even in the other theory there is a similar indication even granting that there is no oscillatory motion by a continuous motion. That is, the precession takes a value of 90° as maximum in the first quadrant; after it passes 90° for getting declination etc., we use $\sin(90° + x) = \sin[180° - (90 - x)] = \sin(90 - x)$ i.e., the sine argument in the second quadrant will be the supplement or of an angle equivalent to x; from the Libra point in the reverse direction (x). Perhaps this was what was in their minds when they advocated the oscillatory motion; still they have limited the maximum value to 27° either side, disregarding the sign. It is only time and future observations beyond the year 5400 Kali (2298 A.D.) that will have to prove how far the Hindu belief of the character of the Ayana-Chalana is true. A simple method (for the present era between 3600 - 5400) for calculating Ayanamsa is:-

Formula 2

Subtract 3600 from the kali year, multiply the balance by 3 and divide by 200; the quotient will be the Ayanamsa in degrees.

Example Kali 5063; Ayanamsa

$$= \frac{(5063 - 3600)}{200} \times 3 = \frac{1463 \times 3}{200} = \frac{43.89}{2}$$

$$= 21° \, 56' \, 42''$$

AYANAMSA FOR 4433 B.C.

Now let us calculate the Ayanamsa for 4433 B.C., as per the two formulae described above.

Formula 1.

Sri Rama's birth year	4433 B.C.
Kali year 3102 B.C.	3102 B.C.
Balance	1331 years

As 1331 is within one quarter of 1800 years, the multiples need not be calculated.

$$\text{Angle traced} = \frac{\overset{100}{90 \times .1331}}{1800} = 66^\circ.55$$

Since 66°.55 is less than 90°, the sine argument is itself;

$$\text{So Ayanamsa} = \frac{66^\circ\ 55 \times 3}{10} = 19^\circ.965$$

Since 1331 is less than 1800 and is in the first quadrant from the Kali year, it traces to the east for the first 1800 years. So the amount of precession is positive i.e., the first point Aries has advanced from the original point of Aries of the fixed zodiac by 19°.965.

Formula 2.

A simple method for calculating Ayanamsa is

Subtract the required year from the Kali year;
Multiply the balance by 3 and divide by 200;
the quotient will be the Ayanamsa in degrees;

Sri Rama's birth year	4433 B.C.
Kali year	3102 B.C.
Balance years	1331

$$\text{Ayanamsa} = \frac{1331 \times 3}{200} = 19^\circ.965 \text{ or } 19^\circ\ 57'\ 54''$$

OBSERVATION:

In the above investigations, we have obtained two values of Ayanamsa for 4433 B.C., by two different sidhantas. They are,

By Vedanga Jyothisha 19°.891045
By Surya Sidhanta;

Formula 1	19°.965
Formula 2	19°.965

No doubt, the difference between the two is very negligible, especially when calculating for periods of a very remote past. However, it is desirable to be precise in our results. In the present case, it is very easy to find out the precise value.

Sayana longitudes of these planets by the modern method as adopted by Nautical Almanac of Greenwich. The difference between these two should be the Ayanamsa for 4433 B.C. This difference must be the same or very near to our values calculated as above. If it is so, our values must be correct. Let us now have a look into this.

Planet.	Sayana Longitude as per Nautical Almanac calculations. o	Nirayana Longitude as given by Valmiki o	Difference between the columns 2 & 3 is Ayanamsa o
(1)	(2)	(3)	(4)
Kuja	278.03504	298.0	19.96496
Guru	70.035083	90.000278	19.965195
Sukra	337.03951	357.00	19.96049
Sani	180.07248	200.00	19.92752

It may be observed that the Ayanamsa arrived at above is within the belt of 19.93 and 19.965195. Our results also are within the belt of 19.92 and 19.965. The value of 19.965 is more realistic.

So we can adopt the Ayanamsa for 4433 B.C. as 19°.965

The sound of the water flowing in rivers, the water discharged by clouds and the murmer of the water gushing from springs, the sound of furious winds, the cries of peacocks and the croaks frogs, that are bereft of joy, have completely vanished now, to be sure.

- Kishkinda Kanda - Canto 30 - Verse 43

> *Conduct alone proclaims a man to be well-born or otherwise, gallant or only fancying himself to be gallant, honest or dishonest.*
>
> *- Valmiki Ramayana - Ayodhya Kanda*
> *- Canto 109 - Verse 4*

CHAPTER V

CALCULATION OF LONGITUDES AND LATITUDES OF PLANETS AT THE TIME OF THE BIRTH OF SRI RAMA

To find the longitude and latitude of the Moon at 17 hours. 23 minutes, 5 seconds, LMT., at Ayodhya, India, on 11th February, 4433 B.C., i.e., 12 Noon Greenwich Mean time first and then finding out the longitude and latitude at Sri Rama's Birth Time of 10 h., 47 m., LMT at Ayodhya on the 11th February. 4433 B.C.

Part I:

The columns denoted by L, M, and V in the following Table V.1.give the values of the Mean Longitude of the Moon for centuries.

Mean anomaly of the Moon and the difference of the Mean longitude of the node to 360°, denoted by V.

These are prepared from the following formulae.

Let L be the mean longitude of the Moon in its undisturbed orbit.
Let Z be the mean longitude of the Moon's ascending node.
Let P be the longitude of the Moon's perigee in its undisturbed orbit.
Let W be the distance of the perigee from the node in Undisturbed orbit.
Let T be the time reckoned in Julian centuries of 36525 days from the epoch 3200 B.C., January, 0.5 day i.e., noon Greenwich and 17 h. 23 m. 5 secs. L.M.T. at Ayodhya, India.

$L = 219°.3086 - (1336_r)\ 307°\ 53'\ 26.06'' T + 7''.14\ T^2 + 0''.0068\ T^3 = Z + w + M$ - formula 1

$P = 334°\ 19'\ 46''.4 - (11_r)\ 109°02'\ 02''.52\ T - 37''.17\ T^2 - 0''.045\ T^3$

$= Z + W$ - Formula 2

So $L = 219°.3086 + (1336_r) 307°.890572222222\, T + 0°.00918333333\ T^2 + 0°.00000188\ T^3$

~~105~~ for 1900 AD . 294°.56984

Putting $l = (1336_r)\ 307°\ 53'\ 26''.06\ T$, we have
for one century of 25 leap years, $l = (1336_r)\ 307°.8905722222$
for one century of 24 leap years, $l = (1336_r)\ 294°.71417549197$
for one ordinary year of 365 days, $l = (13_r)\ 129°.38480654125$
for one day in an year of 365 days, $l = 13°.17639673025$
In the motion of M, putting $a = (1325_r)\ 198°\ 51'\ 23'', 54\ T$, we have
for one century of 25 leap years, $a = (1325_r)\ 198°.85653869325$
for one century of 24 leap years, $a = (1325_r)\ 185°.79154604332$
for one ordinary year of 365 days, $a = (13_r)\ 88°.72231722445$
In the motion of V, putting $b = (5_r)\ 134°\ 08'\ 31''.23\ T$, we have
for one century of 25 leap years, $b = 134°.142008355$
for one century of 24 leap years, $b = (5_r)\ 134°.08905443280$
for one ordinary year of 365 days. $b = 19°.321816030$

$M = 44°.2561 + (1325)r\ 198°.~~85~~\ 51'23''.54\ T + 44''.31\ T^2 + 0''.0518\ T^3$

$V = 259°12'35''.11 - 6962911''.23\ T + 7''.48\ T^2 + 0.008\ T^3$ (1900 AD

3200 AD) 100.2729

TABLE V.1.

MOON

B.C. Years	L	M	V
	o	o	o
3200	219.3086	44.2561	100.2729
3300	271.4181	205.3997	326.1309
3400	323.5276	6.5432	191.9889
3500	15.6371	167.6867	54.8469
3600	67.7466	328.8302	283.7049
3700	119.8561	129.9737	149.5629
3800	171.9656	291.1172	15.4209
3900	224.0751	92.2607	241.2789
4000	276.1846	253.2042	107.1369
4100	328.2941	54.5477	332.9949
4200	20.4036	215.6912	198.8529
4300	72.5131	16.8347	64.7109
4400	124.6226	177.9782	290.5689
4500	176.7321	339.1217	156.4269
4600	228.8416	140.2642	22.2849
4700	280.9511	301.4087	248.1429
4800	333.0606	102.5522	114.0009
4900	25.1701	263.6957	339.8589
5000	77.2796	64.8392	205.7169

M in 1900 AD
229°.97832

MOON

Table 2.

Secular Variation - Part 1.

B.C. Years	L	M	V
	o	o	o
3200	4.957	30.77	-5.192
3300	5.378	32.1202	-5.402
3400	5.799	33.4705	5.616
3500	6.22	34.8207	5.833
3600	6.641	36.1709	6.054
3700	7.062	37.5212	6.28
3800	7.483	38.8715	6.516
3900	7.903	40.2217	6.743
4000	8.324	41.572	6.98
4100	8.745	42.9222	7.222
4200	9.166	44.2725	7.468
4300	9.587	45.6227	7.717
4400	10.008	46.973	7.970
4500	10.429	48.3225	8.223
4600	10.85	49.67[illegible]5	8.480
4700	11.271	51.0237	8.740
4800	11.692	52.374	9.005
4900	12.113	53.7242	9.274
5000	12.534	55.0745	9.546

MOON

Table 3.

Secular Variation - Part 2.

B.C. Years	L	M	U
	o	o	o
3200	0.236	-5.192	0.2778
3300	0.250	5.408	0.2949
3400	0.265	5.616	0.3127
3500	0.2816	5.833	0.3313
3600	0.2984	6.054	0.3507
3700	0.3161	6.280	0.3709
3800	0.3347	6.516	0.3920
3900	0.3542	6.743	0.4140
4000	0.3746	6.980	0.8643
4100	0.3959	7.222	0.6668
4200	0.4181	7.468	0.6915
4300	0.4412	7.717	0.7172
4400	0.4652	7.970	0.7439
4500	0.4902	8.225	0.7706
4600	0.5162	8.480	0.7974
4700	0.5432	8.740	0.8243
4800	0.5712	9.005	0.8513
4900	0.6002	9.274	0.8793
5000	0.6302	9.546	0.9083

MOON

Table 4

Secular variation for perturbances A to E from 3200 B.C. - Part 1.

B.C. Years	A	B	C	D	E
	o	o	o	o	o
− 3200	− 22.03	+ 10.51	− 0.4974	− 19.76	+ 11.01
− 3300	22.94	10.928	0.5174	20.55	11.449
− 3400	23.88	11.355	0.5378	21.36	11.897
− 3500	24.85	11.792	0.5580	22.20	12.354
− 3600	25.84	12.238	0.5798	23.06	12.819
− 3700	26.85	12.692	0.6014	23.93	13.291
− 3800	27.88	13.159	0.6234	24.83	13.771
− 3900	28.93	13.625	0.6458	25.75	14.260
− 4000	30.01	14.014	0.6686	26.65	14.757
− 4100	31.12	14.591	0.6918	27.65	19.087
− 4200	32.26	15.087	0.7157	28.64	20.32
− 4300	33.33	15.591	0.7400	29.65	20.842
− 4400	34.55	16.104	0.7647	30.67	21.372
− 4500	35.84	16.227	0.7898	31.71	21.909
− 4600	37.17	17.159	0.8155	32.78	22.463
− 4700	38.50	17.699	0.8416	33.86	23.017
− 4800	39.86	18.248	0.8681	34.96	23.579
− 4900	41.25	18.798	0.8950	36.11	24.148
− 5000	42.67	19.357	0.9223	37.26	24.725

Secular variation for perturbances A to E from 3200 B.C. - Part 2.

B.C. Years	A o	B o	C o	D o +	E o −
− 3200	+ 1.421	− 0.3768	0.0000	1.4210	0.3768
− 3300	1.5103	0.399	"	1.5070	0.3999
− 3400	1.6036	0.4654	"	1.5960	0.4239
− 3500	1.6969	0.5340	"	1.6910	0.4488
− 3600	1.7937	0.6092	"	1.7860	0.04745
− 3700	1.8937	0.6844	"	2.7710	0.5011
− 3800	1.9972	0.7625	"	2.8730	0.5286
− 3900	2.1047	0.8433	"	2.978	0.5570
− 4000	2.2157	0.9297	"	3.086	0.5863
− 4100	2.3302	1.0161	"	3.197	0.6165
− 4200	2.4487	1.1054	"	3.311	0.6476
− 4300	2.5547	1.1964	"	3.4285	0.6795
− 4400	2.6807	1.2903	"	3.5485	0.7123
− 4500	2.8107	1.3869	"	3.6715	0.7460
− 4600	2.9447	1.4864	"	3.7975	0.7804
− 4700	3.0862	1.5886	"	3.9270	0.8157
− 4800	3.2277	1.6937	"	4.0595	0.8519
− 4900	3.3727	1.8015	"	4.1955	0.8890
− 5000	3.5217	1.9120	"	4.3345	0.9270

Figures for 1900 AD are caalculated, written in hand.

MOON

IMPORTANT PERTURBANCES

Regarding some of the important perturbances caused by the attraction of the Sun and the planets on the Moon, the formulae given in pages 5 to 15 of Hansen's Tables De La Lune are as follows:-

51 Centuries - 13 days -

I. For 3200 B.C. 0.5 day ie. Noon Greenwich Mean Time

$A_o = 248°.2216 + (1148_r)\ 55°.37787761\ T + 0°.00881085\ T^2 + 0°.000011374958\ T^3$

216·91914 - 147·11458 = 69·80456

$B_o = 292°.4778 + (2473_r)\ 254°.23441630\ T + 0°.00420645\ T^2 + 0°.00000301393\ T^3$

309·77382 - 316·95948 = 352·81434

217·66301 - 12·81281 = 204·85020

$C_o = 239°.477 + (99_r)\ 359°.0551667\ T + 0°.0001988055\ T^3$

~~213·34593~~

$D_o = 188°.7439 + (1048_r)\ 56°.32271091\ T + 0°.007903044\ T^2 + 0°.000011374958\ T^3$

203·26724 - 12·81281 = 190·45443

$E_o = 233°.00 + (2373_r)\ 255°.17924960\ T + 0°.004405255\ T^2 + 0°.00000301393\ T^3$

218·59980 - 304·14668 = 354·45312

$F_o = 332°.9044 + (1131_r)\ 172°.20183595\ T + 0°.00430092\ T^2 + 0°.000003347264\ T^3$

126·82875 - 144·97792

= 341·85083

To find out the position for 4400 B.C., substitute T by 12 centuries from 3200 to 4400 B.C. to get the following

		33.1342465 x Annual motion	Sum	Secular Part 1	Correction Part 2	Sum
		o	o	o	o	o
A_o	303°.6868	250.19136	193.87816	− 34.55	+ 2.6807	162.00886
B_o	121°.665	309.92976	71.59476	+ 16.104	− 1.2903	86.40846
C_o	250°.8153	39.8188	290.63418	− 0.7647	+ 0.0000	289.86948
D_o	232°.8718	258.6672	131.539	− 30.67	+ 3.5485	104.4175
E_o	50°.8499	318.4056	9.2555	+ 21.372	− 0.7123	30.55627
F_o	66°.4829	62.45028	128.93318	+ 16.536	− 0.7664	144.70276

To get values of G

A = $+4467''$ Sin $(g - 2g') + 2(w - w')$

= $+1.24083$ Sin A = $1.24083 \times$ Sin $162°.00886$ = $+0.383255$

B = $+2145''$ Sin$(2g^{\circ} - 2g') + 2(w - w')$

= $+0.59583$ Sin B . = $0.59583 \times$ Sin $86°.40846$ $+0.5946597$

C = $+658''$ Sin $(-g)^{\circ}$ = $+658''$ Sin $(180 + g')$

= $+0.18277$ Sin C = $0.18277 \times$ Sin $289°.86948$ -0.178895

D = $+198''$ Sin$(g - {}^{\circ}3g') + 2(w - w')$

= $+0.55$ Sin D_o = $0.55 \times$ Sin 104.4175 $+0.532678$

E = $+155''$ Sin $(2g - 3g') + 2(w - w')$

= $+0.043055$ Sin D_o = $0.043055 \times$ Sin $29°.9152$ = $+0.0217986$

Algebraic total from A to E = 1.3601763

which is the value of G

In Latitude

F = $522''.629$ Sin $(g - 2g') + (w - 2w')$

= $+0.1453$ Sin F_o = $0.1453 \times$ Sin $144°.70276$ $+0.083957$

where (1) g is the mean anomaly of the Moon

g' is the mean anomaly of the Sun

w is the distance of the Moon's perigee from the Moon's ascending node,

w' is the distance of the Sun's perigee from the Moon's ascending node.

1950

(2) for 1800 January 0.5 day

$g' = 0°.40885 + (99_r)\ 359°.0551667\ T$
$- 0°.001644722\ T^2$

$w' = 246°.23102777 + (5_r)\ 135°.8602055\ T$
$- 0°.001644722\ T^2 - 0°.000001840277\ T^3$

Neither noble birth nor good turn nor learning nor gift nor even marriage ties capture the heart of such women, fickle of heart as they are

Ayodhya Kanda - Canto 39 - Verse 23

EQUATION OF CENTRE

C.G. Rajan in his book of planetary positions has given the value of 'equation of centre' for a given Moon anomaly in three parts, viz., J_1, J_2 and J_3. Each of these parts corresponds respectively to each of the three terms of the equation of centre involving sin M, sin 2M and sin 3M where M is the mean anomaly.

1. Mean anomaly of Moon at Noon GMT on 11.2.4433 B.C.	276°.72828
2. Correction for perturbance, 'G'	– 1°.3607176
3. Adding (1) & (2)	275°.36756

Calculation of the value of equation of centre, ie. 'f' for 275°.36756:

	J_1	J_2	J_3
o	o	o	o
275	– 6.266	– 0.0375	0.0100
276	– 6.256	– 0.0449	0.0098
Difference	0.01	0.0074	0.0002
275.36756	– 6.262	– 0.0402	0.0099

Algebraically adding J_1, J_2 and J_3 we get 'f' as – 6°.2923

Reduction factor to the ecliptic 'R':

This factor is required to arrive at the true longitude of Moon. This is prepared from the value 'N' vide item 7 in part IV Calculating it from the values given in Table II of C.G. Rajan's book we get 'R' for the value of 'N' 293°.06681 as 0°.0833.

> ***In a rulerless land self-controlled ascetics, moving all by themselves and contemplating on the self with their own mind and taking up their abode wherever the evening falls, do not move about so for want of hospitable householders.***
>
> ***- Ayodhya Kanda - Canto 67 - Verse 23***

MOON

Corrections due to Secular Variations:

Movement per year		129°.3848065	88°.722317	19°.321816
Sl. No.	Description	Mean Longitude L	Mean Anomaly M	360 − Z V
		o	o	o
1.	Position at Noon GMT or 17 hrs. 23 min. 5 secs. LMT on 1st Jan. 4400 B.C. (Table 1)	124.6226	177.9782	290.5689
2.	Movement in 33.1342465 years till Noon GMT or 17 hrs. 23 mins. 5 secs., on 11.2.4433 B.C.	327.06778	59.74708	280.42355
3.	Adding (1) & (2)	91.69038	237.72528	210.99245
4.	Correction for secular variation Part 1 – (Table 2)	−10.008	46.973	−7.97
5.	Correction for secular variation Part 2 – (Table 3)	−0.4652	−7.97	0.7439
6.	Algebraically adding (3) (4) & (5) to get the Mean Longitude of Moon at Noon GMT or 17 hrs. 23 min. 5 secs. LMT on the 11th Feb. 4433 B.C.	81.21718	276.72828	203.76635

MOON

To find the mean longitude of Moon at 17 hrs. 23 min & 5 secs. LMT at Ayodhya, India on the 11th February, 4433 B.C.

			o
1.	Longitude of Moon at 12 Noon, GMT on the 11th February, 4433 B.C.	L	81.21718
2.	Factor for important perturbances caused by the attraction of the Sun and the planets on the Moon	G	– 1.3607176
3.	Adding (1) & (2)	H	79.856462
4.	Value of the equation of centre for Moon's anomaly	f	– 6.2923
5.	Adding (3) & (4)	K	73.564162
6.	Reduction factor to the ecliptic	R	0.0833
7.	Adding (5) & (6) to get the longitude of Moon at 12 Noon GMT., ie. 17 hrs. 23 min & 5 secs., at Ayodhya, the birth place of Sri Rama		73.647462
8	Less motion of Moon in 6.58 hours at 0°.549 per hour for the birth time of Sri Rama at 10 hr. 47 min. 48 secs. which is 3°.612		70.035462
9.	Adding Ayanamsa of 19°.965		90.000462
10.	Longitude of Moon at the time of birth of Sri Rama as per Valmiki		90.000278

NOTE: **The result arrived at, by a most modern method of calculation adopted all over the present world, is correct almost to the second to what Valmiki has given.**

MOON

Part IV:

To find out the latitude of Moon:

		^{o}
1.	Mean longitude of Moon at Noon GMT on 11.2.4433 B.C.	81.217181
2.	Correction due to important disturbances 'G'	−1.3607176
3.	Adding (1) & (2)	79.856463
4.	Correction due to equation of centre 'f'	−6.2923
5.	Adding (3) & (4), We get 'K' as	73.564163
6.	Value of (360 - Z) i.e., 'V'	203.76635
7.	Adding (5) & (6), we get 'N' as	277.33051
8.	Extracting and calculating 's' from Table 10 of C.G.Rajan's book on Planetary Positions for Moon we get 'S' as	−5.1018833
	Rough work:	
	for 'N' of 277° 'S' = −5.1055556	
	for 'N' of 278° 'S' = −5.0944444	
	for 'N' of 277.33051 'S' = -5.1018833	
9.	Correction due to perturbances	0.0833
10.	Adding (8) &, we get	−5.0185833
		or -5 1′ 7″

So the latitude of Moon at the Birth Time of Sri Rama is 5° 1′ 7″ (South)

> ***The autumnal streams gradually reveal their banks in the same way as brides bashful in their first meeting with their spouse uncover their body by degrees.***
>
> ***Kishkinda - Bala Kanda 4 - Canto 30 - Verse 58***

RAHU AND KETU

To find the longitudes of Rahu and Ketu at 17 hours, 23 min. 5 secs. LMT at Ayodhya on the 11th February, 4433 B.C., first and to find the Longitude for the birth time of Sri Rama at 10th 46m. 48sec. at Ayodhya on the 11th February, 4433 B.C.

Rahu and Ketu are Indian planets in the sense that these planets do not find a similar status in the western systems.

Further, just as Varamihira has omitted reference to Rahu and Ketu Valmiki also has omitted reference to them. However Valmiki has referred to the movements and effects of Rahu and Ketu in his text. So we have to find out the longitudes of Rahu and Ketu.

European Almanacs and Ephemeris give usually only the Mean Longitude of the Ascending Node (Rahu) without giving the True Longitude. To get the true longitude, two corrections are necessary.

They are, (1) due to the Nutation in Longitude and
(2) due to the several inequalities to which the node is subject.

But the greatest of the several quantities which make up the correction of Nutation is 17".234, and the correction for the greatest of the inequalities ranges from 1° 30′ 26" to − 1° 30′ 26". However the author has taken both the inequalities into consideration and has calculated the following.

The magnitude of the correction due to the Nutation has been taken from Table 8 of C.G.Rajan's book in his planetary tables. This works out to be 53 seconds i.e., − 0°.0147336.

The magnitude of correction 'C' due to the greatest inequality of Node is 5426" Sin 2(S-Z) where S stands for the true longitude of Sun and Z stands for the mean longitude of the Ascending Node.

In a rulerless land even the Brahmans richly endowed with wealth do not pay handsome sacrificial fees to the priests officiating even at big sacrificial performances.

-Ayodhya Kanda - Canto 67, Verse 14.

Now let us calculate the longitudes of Rahu and Ketu.

1.	'V' for 4400 B.C., 0.5 day (Table V.1.)	290°.5689
2.	For 0.331342465 of a century at 134°.1222062 per century	44 .446998
3.	Subtracting	246°.1219
4.	Secular correction, part 1	−7°.97
5.	Secular correction, part 2	0°.7439

6. Algebraically adding (3), (4) & (5), we get 'V' as 238°.8958
7. Z = 360° − 238°.8958 = 121°.1042
8. Correction for Nutation 'U' = −0°.0041666
9. Correction for the inequality of the Node:

   P = 2(9° − 121°.1042) = 224°.2084

   Now taking C = 5426″ Sin P where P stands for 2 (S − Z)

   P = 2(9° − 121°.1042) = 224°.2084

   Now taking C = 5426″ Sin P, we have 5426″ × Sin 224°.2084

= 5426″ × 0°.6972702	=	−1°.059411
'U'	=	−0°.0147336
'C' − 'U'	=	+1°.04467745
Z	=	121°.1402
'C' − 'U' − Z	=	120 .05952
So Longitude of Rahu	=	120 .05952
Add motion of Rahu in 6.58 hrs at 0°.529916 per 24 hours for the Birth Time of Sri Rama at 10h. 47m. 48secs. A.M. LMT.		0°.0145285
Longitude of Rahu		120 .07405 or 120° 4′ 26″
Adding 180°, we get the longitude of Ketu as		300 .07405 or 300° 4′ 26″

KUJA

To find the longitude and latitude of Kuja at 17h. 23m. 5secs. LMT at Ayodhya, India i.e. at Noon Greenwich on the 11th February, 4433 B.C.

SECTION I.

(a) The columns denoted by L, G and U in the following tables give the values of the Mean Longitude, Mean Anomaly and the Mean argument of latitude of Kuja for centuries. These are prepaied from the following formulae.

(b) Let L be the mean longitude of Kuja in its undisturbed orbit.
Let g be the mean anomaly.
Let U be the argument of latitude.
Let T be the time reckoned in Julian centuries of 36525 days, from the epoch 3200 B.C., January, 0.5 day i.e., Noon Greenwich.

120705106

1. $L = 33° 22' 12''.62 + 68910117.19T + 1''.1184T^2$

333.260449

2. $g = 152° 59' 49''.49 + 68903493.19T - 0''.651T^2 + 0''.004T^3$
3. $U = 23° 55' 23''.22 + 68907340''.7T + 1''.1234T^2 + 0''.0192T^3$

(c) Now in the motion of L, putting l = 68910117''.62 we have
for one century of 25 leap years, l = (53_r) 61° 41' 57''.62
for one ordinary year of 365 days, l = 191° 17' 09''.51215082
for one hour of 365 days a year l = 0° 1' 18''.61067

(d) In the motion of putting a = 68903493''.19T, we have
for one century of 25 leap years, a = (53_r) 59° 51' 33''.19
for one ordinary year of 365 days, a = 191° 16' 3''.31319084

(e) In the motion of U, putting b = 68907340''.74T, we have
for one century of 25 leap years, b = (53_r) 60° 55' 40.74
for one ordinary year of 365 days, b = 191° 16' 41''.762364134

g = ~~333°.60475~~ on ~~1900 A.D~~ . 318.387964

~~U = 157.45594 in 1900 AD~~ 041092

Serpents of many colours carrying terrible poison in their fangs which remained shut up for a long time in holes for fear of rains ever since the time clouds newly made their appearance in the sky and which were all but dead, their means of sustenance having been completely cut off, are now emerging freely from their holes tormented as they are with hunger.

- Kishkinda Kanda - Canto 30 - Verse 44

L = 292.416147
U = 242.918470

TABLE I.

KUJA

Abbreviation	L	g	U
Motion per century	61°.699339	59°.859219	60° 927983
B.C. Years	o	o	o
3200	33.370172	152.99708	23.923117
3300	331.67085	93.137861	322.99513
3400	269.97149	33.278642	262.06715
3500	208.27216	333.41942	201.13197
3600	146.57282	273.5602	140.21119
3700	84.873478	213.70099	79.283202
3800	23.174139	153.84177	18.355219
3900	321.4748	93.982547	317.42724
4000	239.77546	34.123328	256.49925
4100	198.07612	334.26411	195.57127
4200	136.37678	274.40489	134.64329
4300	74.67744	214.54567	73.15304
4400	12.978056	154.68645	12.787321
4500	311.27877	94.827233	311.85934
4600	249.57943	34.968014	250.93136
4700	187.88009	335.1088	190.00337
4800	126.19075	275.24958	129.07539
4900	64.48411	215.39036	68.147406
5000	2.782072	155.53114	7.219423

Adorned with water-lilies, the water in the big pond with a solitary swan lying asleep on it looks delightful like the sky completely bereft of clouds, nay, illumined by the full moon and spangled with a hose of stars at night.

Kishkinda Kanda - Canto 30 - Verse 47

KUJA.

TABLE 2.

Secular Variation - Part 1.

B.C. Years	L	g	U
	o	o	o
3200	0.8078	4.7028	0.8114
3300	0.8389	4.8889	0.8431
3400	0.8560	5.0850	1.1671
3500	0.8861	5.2823	1.2003
3600	0.9122	5.4846	1.2342
3700	0.9382	5.6929	1.2688
3800	0.9643	5.9072	1.3041
3900	0.9904	6.1265	1.3402
4000	1.0165	6.3408	1.3770
4100	1.0426	6.5701	1.4144
4200	1.0687	6.8154	1.4524
4300	1.0948	7.0357	1.4910
4400	1.1209	7.28357	1.5303
4500	1.1470	7.5513	1.5702
4600	1.1731	7.8316	1.6108
4700	1.1731	7.8136	1.6108
4800	1.2252	8.3442	1.6939
4900	1.2514	8.6185	1.7369
5000	1.2772	8.8988	1.7809

A King who is licentious and evil minded, is of evil conduct and is counselled by sinful men, surely ruins himself, his own kith and kin and well as his state.

Aranya.Kanda - Canto 37 - Verse 2

KUJA

TABLE 3.

Secular Variation - Part 2.

B.C.Years	g o	U o
3200	0.1474	0.7075
3300	0.1562	0.7496
3400	0.1653	0.7931
3500	0.1748	0.8379
3600	0.1846	0.8841
3700	0.1947	0.9316
3800	0.2502	0.9805
3900	0.2160	1.0309
4000	0.2271	1.0827
4100	0.2386	1.1359
4200	0.2504	1.1906
4300	0.2626	1.2467
4400	0.2751	1.3043
4500	0.2880	1.3636
4600	0.3012	1.4256
4700	0.3148	1.4877
4800	0.3289	1.5513
4900	0.3434	1.6165
5000	0.3582	1.6832

No state can be ruled by a king who is severe, nor by him who is most adversely disposed to the people nor by him who is boorish in his manners.

Aranya Kanda - Canto 42 - Verse 11

KUJA.

Table 4.

Rossis Correction to Newcomb's formula.

B.C. Years	L	g	U
	o	o	o
3200	0.18509	0.2180	0.1660
3300	0.2419875	0.2225	0.1673
3400	0.298885	0.2270	0.1686
3500	0.3557825	0.2315	0.1698
3600	0.41268	0.2360	0.1711
3700	0.4695775	0.2404	0.1724
3800	0.526475	0.2449	0.1737
3900	0.5833725	0.2493	0.1750
4000	0.64027	0.2538	0.1762
4100	0.6971675	0.2583	0.1775
4200	0.754065	0.2627	0.1788
4300	0.8109625	0.2672	0.1800
4400	0.86786	0.27169	0.18131
4500	0.9247575	0.2762	0.1820
4600	0.981655	0.2806	0.1839
4700	1.0385525	0.2851	0.1851
4800	1.09545	0.2896	0.1864
4900	1.1523475	0.2940	0.1877
5000	1.209245	0.2988	0.1891

People speaking agreeable words are always easy to find. He, who speaks words which though unpalatable, are yet wholesome, is difficult to find.

- Aranya Kanda - Canto 37 - Verse 2

KUJA

(c) Calculation of Reduction to the ecliptic of Kuja 'M'

1. Argument of latitude of Kuja, U on 11.2.4433 B.C. = 231°.05488
2. Adding equation of centre, f, 4°.0037, we get 235°.05858
3. Extract from Table ll of Mars from C.G.Rajan's Tables for the reduction to the ecliptic, M for 253.0585. Subtracting 180°.00 we get 55°.0585.

U	(0)U M "	(½)U M "	(1)U M "	U
55	55	55	55	235
56	54	54	54	236

Therefore, for 235°.0585 by rule of three, we get M as −0°.0152. Since U is between 180° and 270°, M is negative.

Secular Variation of Reduction to the ecliptic has not been taken into consideration, because it is a very negligible quantity.

(d) Calculation of Heliocentric latitude of Kuja

We have seen above that U is 235°.0585 after correction.

Since it is greater than 180°, we have to subtract 180° and we get 55°.05968.

Extract from Table 12 for Mars from C.G.Rajan's Tables, b:

U	(0)U	(½)U	(1)U	U
55	1° 30′ 56″	1° 31′ 29″	1° 32′ 02″	
56	1° 32′ 2″	1° 32′ 34″	1° 33′ 06″	

For 55°.05968 by rule of three method, b_1 = 1° 30′ 9″.6
Since U is greater than 180 deg., b_1 is negative.

(e) Calculation of Secular Variation of the latitude in seconds, b_2:

Extract from Table 13 of C.G.Rajan's Tables for secular variation of Kuja's latitude in seconds, b_2

U	b_2
o	o
55	2
56	2

For 55°.05968, 55″ or 0°.0152777.

Since U is greater than 180 degrees, b_2 is negative.

$b = b_1 + b_2 = -1°.5026 - -0°.015277 = -1°.5179$

SECTION III.

(a) **Calculation of Equation of Centre of Kuja 'f':**

Equation of Centre of Kuja 'f'

g		(0)g	(¼)g	(½)g	(¾)g	(1)g
o	′ o	″ o	′ ″ o	′ ″	o ′ ″	o ′ ″
19	3 54	25 3	57 22 4	0 17	4 3 13	4 6 8
20	4 6	8 4	9 3 4	11 50	4 14 44	4 17 37

Therefore, for 19°.47408, $f_1 = -3°.9995404$.

Extract from Table 10 of C.G.Rajan's Tables for secular variation of the Equation of Centre of Mars, f_2:

g for 19° is 15″ and for 20°, 16″ and therefore f_2 for 19.47408 is 15″.

$$f = f_1 + f_2 = 3°.9995404 + 0°.00416 = 4°.0037$$

(b) Radius Vector of Kuja:

From Table 15 for Radius Vector of Mars, r, we get it as 1.13914 since g is near 19.5 deg.

KUJA.

SECTION IV.

		L	g	U
Abbreviation				
Explanation		Mean Longitude	Mean Anomaly	Mean Argument of latitude.
Motion per century		61°.699343	59°.859217	60°.927983
〃 〃 year		191°.28597	191°.26759	191°.27827
Sl. No.	Description	o	o	o
1.	Mean longitude on 3200 B.C., 0.5 day	33.370172	152.99708	23.923117
2.	Movement in 12 centuries, i.e., from 3200 to 4400 B.C.	20.392116	358.31063	11.135796
3.	Subtracting (2) from (1)	12.978056	154.68645	12.787321
4.	Movement in 33.:342465 years	218.11648	217.50747	217.86135
5.	Adding (3) & (4)	231.09454	12.19392	230.64867
6.	Secular Variation Part 1.	−1.1209	7.28357	1.5303
7.	Secular Variation Part 2.	–	−0.2751	1.3043
8.	Rossis correction to Newcomb's formula Table 4	0.86786	0.27169	0.18131
9.	Equation of Centre	4.0037	–	–
10.	Reduction to the ecliptic	−0.0152	–	–
11.	Adding (6) up to (10) algebraically L	234.83	19.47408	231.05598

KUJA

SECTION V:

Conversion of Heliocentric longitude into Geocentric Longitude

(a)	1.	Longitude of the Sun 'S'	.. ..	9°.00
	2.	Radius vector of the Sun, 'R'	.. ..	0 .98347
	3.	Heliocentric Longitude of Kuja 'H'	..	234 .83
	4.	Radius Vector of Kuja 'r'	..	1 .3914

(b) To find the geocentric longitude of Kuja, the formula is

$$\tan P = \frac{r.\ \text{Cos}\ b.\ \text{Sin}\ (H-S)}{R\ + [r.\ \text{Cos}\ b.\ \text{Cos}\ (H-S)]} = \frac{V}{W}$$

$$= \frac{1.3914 \times \text{Cos.}\ 1^\circ.53 \quad \times \text{Sin}\ (234^\circ.83\ -\ 9^\circ.0)}{0.98347 + [1.3914 \times \text{Cos.}\ 1^\circ.53 \quad \times \text{Cos}\ (234^\circ.83\ -\ 9^\circ.0)]}$$

$$= \frac{1.3914 \times 0.9996426 \times -0.7172755}{0.98347 + (1.3914 \times 0.9996426 \times -0.6967896)}$$

$$= \frac{-\ 0.9976669}{0.0142791} = -69.781031. \quad P = 89^\circ.178977$$

Since V is negative and w is negative, adding 180° we get 269°.17898
Since x = P+S, adding S i.e., 9°.0, we get 278°.17898
Adding Ayanamsa for 11th Feb. 4433 B.C. i.e., 19°.965 298°.14398
Less for the movement of Kuja in 6.58 hours,
at 0°.0218361 per hour for the birth time of
Sri Rama at 10h. 47m. 48s.,A.M., LMT,
i.e., 0°.14368, we get 298°.00004

Longitude of Kuja at the time of Sri Rama's birth
as given by Valmiki 298°.00

Note: The difference between our calculation and the longitude given by Valmiki, is very negligible and so rounded as 298°.00

SECTION VI.

Conversion of heliocentric latitude into geocentric latitude:

In Section IV (d) we got the value of heliocentric latitude as $1^\circ.5179$ (S)

Since $P = 269^\circ.72338$ and is near 270°i.e., between 225° and 315°, the formula applicable is

$$\tan y = \frac{r.\ \text{Sin } b.\ \text{Sin } P}{r.\ \text{Cos } b.\ \text{Sin } (H-S)} = \frac{C}{V}$$

Substituting values,

$$= \frac{1.3914 \times \text{Sin } 1^\circ.5179 \times \text{Sin } 269^\circ.17898}{1.3914 \times \text{Cos } 1^\circ.5179 \times \text{Sin } (234^\circ.28 - 9^\circ.0)}$$

$$= \frac{1.3914 \times 0.0264892 \times -0.9998973}{1.3914 \times 0.9996491 \times -0.6967896}$$

$$= \frac{-0.0368532}{-0.9691722}$$

$$= 0.0380254$$

$$y = 2^\circ.1776479 \text{ or } 2^\circ\ 10'\ 39''.5$$

Since both C and V are negative, the latitude is Northern.

So the Geocentric Latitude of SRI RAMA at the time of his BIRTH at 10h. 47m. 48s. A.M.,LMT., at Ayodhya, India on the 11th February, 4433 B.C. is $2^\circ\ 10'\ 39''.5$

No man is the friend of any one, nor is anything to be gained by any one through any one; for alone is a creative born and alone does it perish.

-Jebali to Rama - Valmiki Ramayana
- Ayodhya Kanda - Canto 108 - Verse 3

BUDHA.

To find the heliocentric longitude and latitude of Budha at 17h. 23m. 5s. LMT. at Ayodhya, India on the 11th February, 4433 B.C., i.e., Noon GMT.

The columns denoted by L, g, and U in the following Table I give the values of the Mean Longitude, Mean Anomaly and Mean Argument of latitude of Budha for centuries. They are prepared from the following formulae.

Let L be the mean longitude of Budha in its undisturbed orbit.
Let g be the mean anomaly.
Let U be the argument of latitude.
Let T be the time reckoned in Julian centuries of 36525 days from the epoch 3200 B.C., January, 0.5 day i.e., noon, Greenwich.

~~178·08448~~ ~~174·08448~~ 1900 AD

(1) $L = 49°.677936 + 538106654''.8T + 1''.084T^2$

(2) $g = 53°.107661 + 538101055''.04T + 0''.024T^2$ ~~261·6099~~

(3) $U = 62°.977228 + 538102388''.05T + 0''.458T^2$ 252·281898

Now in the motion of L, putting l	$= 538106654''.8T$, we have
for one century of 25 leap years, l	$= (415_r)\ 74°\ 4'\ 14''.80$
for one ordinary year of 365 days, l	$= (4_r)\ 53°\ 43'\ 3''.408678987$
In the motion of g, putting a	$= 538101055''.04T$, we have
for one century of 365 leap years, a	$= (415_r)\ 72°.30'\ 55''.04$
for one ordinary year of 365 days, a	$= (4_r)\ 53°\ 42'\ 7''.449407255$
In the motion of U, putting b	$= 538102388''.05T$, we have
for one century of 25 leap years, b	$= (415_r)\ 72°\ 63'\ 8''.05$
for one ordinary year of 365 days, b	$= (4_r)\ 53°\ 42'\ 20''.770383299$

(r stands for one complete revolution of 360°).

g at 1900 AD = 98·~~[illegible]~~ 169610

> ***Ministers who counsel violent measures surely reap suffering along with the counselled even as chariots driven by a dull-witted charioteer coursing swiftly on uneven roads perish with the chariots.***
>
> ***- Aranya Kanda - Canto 42 - Verse 12***

L at 1900 AD = ~~174·0867869903~~ 173·30

U at 1900 AD = 136·609863

BUDHA.

TABLE 1.

	L	g	U
	o	o	o
Movement per century	74.070778	72.515287	72.885569
B.C.Years			
3200	49.677936	53.107661	62.977228
3300	335.60716	340.59237	350.09166
3400	261.53638	268.07708	277.20609
3500	187.4656	195.56179	204.32052
3600	113.39482	123.04651	131.43495
3700	39.32404	50.53121	58.54938
3800	325.25327	338.01593	345.66381
3900	251.18249	265.50064	272.77824
4000	177.11171	192.98535	199.89267
4100	103.04094	120.47006	127.0071
4200	28.97016	47.95477	54.12153
4300	314.89938	335.43948	341.23596
4400	240.8286	262.92419	268.35039
4500	166.75782	190.40891	195.46483
4600	92.68704	117.89362	122.57926
4700	18.61629	45.37853	49.69369
4800	304.54549	332.86304	336.80812
4900	230.47471	260.34775	263.92255
5000	156.40394	187.83246	191.03698

Everyone injures him who adopts a severe course of action running counter to the interests of the people as one strikes a wicked serpent arrived near.

- Aranya Kanda - Canto 29 - Verse 4

BUDHA.

TABLE 2.

Secular Variation.

B.C. Years	L	g	U
	o	o	o
3200	0.7830555	0.0173	0.3308
3300	0.968258	0.0179	0.3436
3400	1.1547963	0.0185	0.3564
3500	1.3406666	0.0191	0.3692
3600	1.526537	0.0197	0.3822
3700	1.7124074	0.0203	0.3952
3800	1.8982778	0.0209	0.4084
3900	2.0841481	0.0215	0.4218
4000	2.2700185	0.0221	0.4352
4100	2.4559	0.0227	0.4486
4200	2.6418	0.0233	0.462
4300	2.8276	0.0239	0.4756
4400	3.0135	0.0245	0.4894
4500	3.1994	0.0251	0.5032
4600	3.3852	0.0257	0.5172
4700	3.5711	0.0263	0.5312
4800	3.757	0.0269	0.5412
4900	3.9429	0.0275	0.5594
5000	4.1287	0.0281	0.5738

People turn away in fear from a man telling lies in the same way as they do from a serpent. Virtue has its culmination in truthfulness; nay, it is declared to be the root of all

- Ayodhya Kanda - Canto 109 - Verse 12

BUDHA

SECTION III.

Calculation of Equation of centre 'f':

1. From Table 7 of C.G. Rajan's Tables of Budha for 'g' 283°.57118 (Section IV)

f_1	=	$-23°.6725$
f_2	=	$-\ 0°.0025$
f	=	$-23°.675$

2. **Calculation of the Radius Vector, 'r':**

From Table 13 of C.G. Rajan's Tables of Budha for g = 283°.57118 (Section IV)

we get 'r' as 0.38472

3. **Calculation of Reduction to the ecliptic in seconds of** arc 'M'

Argument of latitude of Budha, (Section IV) 289°.33959

Subtracting equation of centre 'f', −23°.675, we get U as 265°.66459

From Table 9 of C.G.Rajan's Tables of Mercury, we get M for 265°.66459 as −0.0325

Since U is between 180 and 270 degrees, 'M' is negative.

4. **Calculation of heliocentric latitude of Budha:**

Since U is greater than 180°, subtracting 180° from 265.66459 we get 85°.66459

From Table 10 of C.G.Rajan's Tables of Mercury, we extract

for 85°.0 ..	6°.976111
for 86°.0 ..	6°.985833
Difference	0°.0097222

for 85.66459, b_1 = 6°.9825724

From Table 11 of C.G.Rajan's Tables of mercury, we get b_2 for as 0°.0019444

$b = b_1 + b_2 =$ 6°.9825724 + 0°.0019444 = −6°.9845168

So the heliocentric latitude of Budha is −6°.9845168.

BUDHA

SECTION IV.

Abbreviation	L	g	U
Explanation	Mean Longitude	Mean Anomaly	Mean Argument of latitude.
	o	o	o
1. Movement per year	53.717613	53.702067	53.705769
2. Movement per century	74.070778	72.515289	72.885569
3. Position on 3200 B.C. 0.5 day (Table 1)	49.677936	53.107661	62.977228
4. Movement in 12 centuries i.e., from 3200 to 4400 B.C.	168.84934	150.18347	154.62683
5. Subtracting (4) from (3)	240.8286	262.92419	268.35039
6. Movement in 33.1342465 years at 53.717613 per year	339.8926	−339.37751	−339.5002
7. Adding algebraically (5) & (6)	220.7212	283.54668	288.85019
8. Secular variation correction (Table 2)	3.0135	0.0245	0.4894
9. Equation of centre 'f'	−23.675	–	−23.675
10. Reduction to the ecliptic of Budha in seconds of arc 'M'	− 0.0325		
11. Adding algebraically (7) (8) and (9)	200.0272	283.57118	265.66459

SECTION V:

Conversion of heliocentric longitude into geocentric longitude.

1. Longitude of the Sun, 'S' .. .. 9°.00
2. Radius Vector of Sun, 'R' 0.98347
3. Heliocentric longitude of Budha, H 200.0272
4. Radius Vector of Budha, 'r' 0.38472

To find out the geocentric longitude, the following is the formula.

$$\tan P = \frac{r.\ \cos b.\ \text{Sin}\ (H-S)}{R + r.\ \cos b.\ \text{Cos}\ (H-S)} = \frac{V}{W}$$

Substituting values, $(H-S) = 200°.0272 - 9°.0 = 191°.0272$

$$\tan P = \frac{0.38472 \times \text{Cos}\ 6°.9845168 \times \text{Sin}\ 191°.0272}{0.98347 + 0.38472 \times \text{Cos}\ 6°.9845168 \times \text{Cos}\ 191°.0272}$$

$$= \frac{0.38472 \times 0.992579 \times -0.1912749}{0.98347 + 0.38472 \times 0.992579 \times -0.9815364}$$

$$= \frac{0.0730411}{0.6086555} = -0.1200039 \quad P = 6°.842988.$$

Since V is negative and W is positive, subtracting from 360°, we get P as 353°.157

1. Longitude of the Sun 'S' 9°.00
2. Adding 362°.157
3: Ayanamsa for 4433 B.C. 19°.965
4. Adding (2) & (3) we get the geocentric longitude 382°.122 at 12 Noon Greenwich or at 17h. 23m. 5s. LMT or 22°.122 on the 11th February, 4433 B.C.
5. Motion of Budha in 6.58 hours at 0°.1705156 per hour for the birth time of Sri Rama at 10h. 47m. 48s., A.M. LMT on the 11th February, 4433 B.C. 1°.122

6. Subtracting (5) from (4), we get 21°.00

So the Geocentric Longitude of Budha at the time of birth of Sri Rama at 10h. 47m. 48s. on the 11th February, 4433 B.C. is 21°.00

NOTE:

Sage Valmiki has given the longitudes of Sun, Moon, Kuja, Guru and Saturn, correct to the second; he has not given the longitude of Budha. The most modern method of calculating the longitudes have been adopted and found correct for the planets for which Valmiki has given the longitudes.The same method is adopted for Budha. So the longitude of 21°.00 arrived at by calculation must be correct.

Even the carnivora refuse to feed on the flesh of those ungrateful beings when they are dead, who though having achieved their own end, actually fail to be of any service to their beneficient friends whose object has not yet been accomplished.

- Kishkinda Kanda - Bala Kanda 4
Canto 30 - Verse 73

BUDHA

SECTION VI

Conversion of Heliocentric latitude into Geocentric Latitude:

1. Longitude of the Sun, 'S' .. .. 9°.00
2. Radius Vector of Sun, 'R' 0.98347
3. Heliocentric Longitude of Budha, 'L' 191°.0272
4. Heliocentric latitude of Budha, 'b' 0.38472

Since P, 353°.6977 is near 360° i.e., between 315° and 45°, the formula applicable is

$$\tan y = \frac{r.\ \text{Sin}\ b.\ \text{Cos}\ P}{R + r.\ \text{Cos}\ b.\ \text{Cos}\ (H - S)} = \frac{C}{V}$$

$$= \frac{0.38472 \times \text{Sin}\ 6.9845168 \times \text{Cos}\ 353^\circ.69777}{0.98347 + 0.38472 \times \text{Cos}\ 6.9845168 \times \text{Cos}\ 191\ .0272}$$

$$= \frac{0.38472 \times 0.1216 \times 0.9939566}{0.98347 + 0.38472 \times 0.992579 \times -0.9815364}$$

$$= \frac{0.0464996}{0.6086555}$$

$$= 0.0763972$$

$$y = 4^\circ 3687526 \text{ or } 4^\circ\ 22'\ 7''.51$$

Since both C and V are positive, the latitude is Northern. Thus the Geocentric Latitude at the time of the birth of Sri Rama is

4°.367526 (North)

or

4° 22′ 7″.51 (North)

GURU

To find the longitude and latitude of Guru at 17h. 23m. 5 Secs. (LMT) at Ayodhya, India i.e., Noon Greenwich on the 11th February, 4433 B.C.

SECTION I.

(a) The columns denoted by L, g and U in the following tables give the values of the Mean Longitude, Mean anomaly and the Mean Argument of latitude of **Guru**. These are derived from the following formulae.

(b) Let L be the mean longitude of Guru in its undisturbed orbit.

Let g be the mean anomaly

Let U be the argument of latitude.

Let T be the time reckoned in Julian centuries of 36525 days from the epoch 1900 A.D., January, 0.5 day i.e., Noon Greenwich. This is done in continuation of C.G Rajan's Tables for Jupiter.

(1) $L = 238^\circ.0496 + 10930687''.148\ T\ 1''.20486T^2 - 0''.005936\ T^3$.

(2) $g = 225^\circ.32833 + 10924891''.286\ T\ 2''.59772\ T^2\ 0''.06314\ T^3$

(3) $U = 138^\circ.60587 + 10927049''.24\ T\ 0''.06314\ T^2\ 0''.024704\ T^3$

(c) Now in the motion of L, putting $l = 10930687''.148\ T$ we have

for one century of 25 leap years, $l = (8_r)\ 156^\circ\ 20'$

for one ordinary year of 365 days, $l = 30^\circ\ 20'\ 32''.05500397$

for one hour in 365 days a year, $l = 0^\circ\ 0'\ 12''.46941$.

(d) In the motion of g putting $a = 10924891''.286T$, we have,

for one century of 25 leap years, $a = (8_r)\ 154^\circ\ 43'$

for one ordinary year of 365 days, $a = 30^\circ\ 19'\ 35''$

(e) In the motion of U, putting $b = 10927049''.24\ T$, we have,

for one century of 25 leap years, $b = (8_r)\ 155^\circ\ 19'$

for one ordinary year of 365 days, $b = 30^\circ\ 19'\ 56.700824093$.

(r stands for one complete revolution of 360 degrees)

SECTION II.

GURU

TABLE 1.

Secular variation – Part 1.

B.C. Years	L o	g o	U o
3200	0.8705555	0.7633055	0.9543888
3300	0.9041666	0.7491945	0.9526886
3400	0.9377777	0.6030835	0.9509333
3500	0.9713888	0.5834166	0.9491271
3600	1.0049999	0.5632219	0.9473104
3700	1.0386111	0.5430272	0.9454991
3800	1.0722221	0.5223604	0.9436878
3900	1.1058332	0.5011936	0.9418764
4000	1.1394443	0.4795818	0.9399814
4100	1.1730544	0.4573591	0.9390864
4200	1.2066665	0.4346086	0.9361639
4300	1.2402776	0.407586	0.9341859
4400	1.2738887	0.3800634	0.9322079
4500	1.3074998	0.3520958	0.9302298
4600	1.3411109	0.3235173	0.9278948
4700	1.374722	0.2944111	0.9258056
4800	1.4083331	0.2648067	0.9237164
4900	1.4419442	0.2347534	0.9216272
5000	1.4755553	0.2042576	0.9195379

Many righteous souls in the world who have practised virtue enjoined on them have perished with their followers through the offences of others.

- Aranya Kanda - Canto 42 - Verse 13

GURU

TABLE 2.

Secular Variation — Part 2.

B.C. Years	L o	g o
3200	1.2187222	0.7633055
3300	1.2171624	0.7449456
3400	1.2156026	0.7261412
3500	1.2140428	0.7068923
3600	1.2124831	0.6870323
3700	1.2109232	0.6667001
3800	1.2093634	0.6464152
3900	1.2078036	0.6212093
4000	1.2062438	0.5956034
4100	1.2046841	0.5695553
4200	1.2031243	0.5428915
4300	1.2015644	0.5157578
4400	1.2000037	0.4885714
4500	1.1984448	0.4609405
4600	1.1968851	0.4326985
4700	1.1953292	0.4039843
4800	1.1937654	0.374729
4900	1.1922056	0.3455615
5000	1.1906458	0.315739

In a rulerless land people do not quickly move out decked with ornaments in chariots driven by spirited horses of excellent breed.

-Ayodhya Kanda - Canto 67 - Verse 25

GURU

SECTION III.

(a) Calculation of Equation of Centre of Guru; 'f'

In section IV, we get the value of 'g' as 324°.97945.

Extract from Table 9 of C.G. Rajan's Tables for Equation of Centre of Jupiter 'f_1':

g	f_1	g
35	3° 20′ 30″	325
36	3° 25′ 18″	324

When g is between 180 and 360°, f_1 is negative.
So for g = 324.97945, f_1 = −3.433107 (by rule of three)

Extract from Table 10 of C.G.Rajan's Tables for Equation of Centre of Guru 'f_2':

g	f_2	g
35	39″	325
36	40″	324

When g is between 180° and 360°, f_2 is negative.
So, for g = 324°.97945, 'f_2' is − 0.010833. (by rule of three).
$f = f_1 + f_2 = -3.3433107 + -0.010833 \doteq -3.354144$

(b) Radius Vector Guru: 'r'.

Value of 'g' is 324°.97945.

Extract from Table 14(a) of C.G. Rajan's Tables for Guru 'r':

g	r	g
35	4.9930	325
36	4.9958	324

So for g = 324°.97945, r = 4.9930575 (by rule of three)

GURU

(c) Calculation of Reduction to the Ecliptic of Guru 'M':

1. Argument of latitude of Guru (Section IV)		279°.86145
2. Secular variation, Part 1	–	0°.9341859
3. Constant Correction	–	1°.000
4. Equation of Centre 'f'	–	3°.354144
5. Adding (1) to (4) algebraically, we get U as		274°.57312

6. Extract from Table 12 of C.G. Rajan's Tables for Jupiter for the Reduction to the ecliptic 'M':

(When U is greater than 180°, take U – 180° and apply this table). and apply this table.

U	M
94	2″
95	3″

Therefore, for U = 274°.57312, M = –0.00083 (by rule of three)

(d) Calculation of Heliocentric latitude of Guru 'b':

We have seen above that 'U' after correction is 274°.57312. When U is greater than 180°, we have to take U – 180° i.e., 94°.57312.

Extract from Table 13 of C.G. Rajan's Tables of Jupiter 'b_1':

Latitude of Guru 'b_1'

U	b_1
274	1° 18′ 19″
275	1° 18′ 13″

Therefore, for U = 274°.57312, 'b_1' = –1.3043226 (by rule of three).Since U is between 180° and 360°, b_1 is negative or Southern.

GURU

(e) Calculation of The Great Inequality (or Long Period Inequality): 'E'

In his Table 8 of the Great Inequality (or Long Period of Inequality, C.G. Rajan has given the values of this inequality 'E'

for a period from 1800 A.D. to 2100 A.D. from the following formula.

$E = (1186''.618572 - 0''.0347004t + 0''.000033372t^2)$ Sin c $- 12''.013596$ Sin 2c. where $c = 95°.8814 + 0°.38633184t + 0°.0000035 1 t^2$, and t is the number of years from 1800 A.D., t being positive for year after 1800 A.D. and negative for year before 1800 A.D.

However since E will not increase 0° 36′ 35″ in any case, this value is adopted. So E is 0°.609722.

(f) Calculation of inequalities of Jupiter (planetary perturbations) 'p':

(from Table 11 of C.G. Rajan's Tables of Jupiter)

We have J = 74°, Saturn 'S' = 184°.85477 and t = 6233.

			(+) ″	(−) ″
1.	(74 − 184°.85477 − 1° 9′ 7″)	= A =	−248	75
2.	(2 × 74) − (2 × 184.85477) − 0°35′ 6″	= B =	−137.7	134
3.	(3 × 74) − (3 × 184.85477)	= C =	27.45	8
4.	74 × (2 × 184.85477) + 15.26 × 6233	= D =	104.06	130
5.	(2 × 74) − (4 × 184.85) + 28° 36′ 7″	= E =	157.2	32
6.	(2 × 74) − (3 × 184.85) − 61°/33′ 36″	= F =	297	48
7.	(3 × 74) − (5 × 184,85) + 56°23′ 6″ + 50″.51 × 6233	= G =	−161.59	50
8.	(3 × 74) − (4 × 184.85) − 62° 48′7″	= K =	−139.8	10
9.	(3 × 74) − (2 × 184.85) − 8°48′40″	= P =	203.49	5
10.	(2 × (184.85 − 74) + 68°12′ 7″	= Q =	3.9	1
11.	184.85 − 44° 56′ 46″	= V	139.9	7
12.	(4 × 74) − (5 × 184.85) + 58° 0′ 50″	= W =	149.76	6
			67	439

Net − 439 + 67 = − 372″

ie − 0°.10333

GURU

SECTION IV.

Abbreviation	L	g	U
Explanation	Mean Longitude	Mean Anomaly	Mean Argument of latitude.
1. Daily motion in deg.	0.0831305	0.0830861	0.0831027
2. Movement in one year in degrees	30.342633	30.326427	30.332514
3. Movement per century in degrees	156.34142	154.71971	155.32887

Description	o	o	o
4. Mean longitude in 1900 A.D.	238.0496	225.32833	138.60587
5. Movement in 63 centuries	129.50946	27.34173	65.71884
6. Mean longitude on 4400 B.C., 0.5 day (adding algebraically)	7.55906	252.67006	204.32471
7. Movement in 33.115068 years	284.79836	284.26169	284.46326
8. Mean longitude on the 11th Feb. 4433 B.C.	82.7607	328.40837	279.86145
9. Correction for secular variation-part 1	1.2738887	−0.3800634	−0.9341859
10. -do- Part 2	−1.2000037	−0.4885714	−
11. Adding algebraically (8) (9) & (10)	82.834585	327.97945	278.92726
12. Constant Correction	−	−3.0	−1.00
13. Correction for inequalities 'P'	−0.103333	−	−
14. Correction for the long period inequality 'E'	0.609722	−	−

15.	Reduction to the ecliptic 'M'	−0.00083		
16.	Adding algebraically (11) to (15)	83.340144	324.97945	277.92726
17.	Equation of centre	−3.354144		
18.	Heliocentric Long.	79°.986		274.57312

GURU

SECTION V.

Conversion of Heliocentric longitude into Geocentric longitude:

(a) Longitude of Sun, 'S' — 9°.0
Radius Vector of Sun, 'R' — 0 .98347
Heliocentric longitude 'H' — 79°.986
Radius Vector of Guru 'r' — 4 .9930575
Heliocentric latitude of Guru 'b' — 1°.3043226

(b) To find the Geocentric longitude of Guru, the formula is,

$$\tan P = \frac{r.\cos b.\ \sin(H-S)}{R + r.\cos b.\ \cos(H-S)} = \frac{V}{W}$$

Substituting values, $(H-S) = 79°.986 - 9°.0 = 70°.986$.

$$\tan P = \frac{4.9930575 \times \cos 1°.3043226 \times \sin 70°.986}{0.98347 + 4.9930575 \times \cos 1°.3043226 \times \cos 70°.986}$$

$$= \frac{4.9930575 \times 0.9997408 \times 0.945439}{0.98347 + 4.9940575 \times 0.9997408 \times 0.3257991}$$

$$= \frac{4.9917633 \times 0.945439}{0.98347 + 4.9917633 \times 0.3257991}$$

$$= \frac{4.7194077}{2.6097824} = 1.8083532 \qquad P = 61°.057875$$

(c)	P	61°.057875
	Sun's longitude	9°.0
	Adding	70°.057875
	Ayanamsa	19°.965
	Adding	90°.022875
	Movement of Guru in 6.58 hours at 0°.0034637708 per hour for the birth time of Sri Rama at 10h. 47m. 48 secs. (LMT)	0°.0227916
	Subtracting	90°.000083
	Longitude of Guru at the time of Sri Rama's birth as given by Valmiki	90°.000278

In the absence of a stable government even those, who do not believe in life after death and have flagrantly violated the rules of conduct prescribed by the Vedas and who have been tormented with punishment inflicted by the king and whose fear of punishment has now been dispelled by the anarchy prevailing at the time, are able to exercise authority over others.

-Ayodhya Kanda - Canto 67 - Verse 32

GURU

SECTION VI

Conversion of heliocentric latitude into geocentric latitude.

In Section III (d), we got the heliocentric latitude of Guru as $-1°.3043226$ (South)

We know, that

P	=	$61°.057875$
Heliocentric longitude of Guru 'H'	=	$70°.986$
Radius Vector of Guru 'r'	=	4 .9930575
H - S	=	$61°.057875$

Since P is between 45 and 135° the formula applicable is

$$\tan y = \frac{r.\text{Sin } b.\ \text{Sin } P}{r.\ \text{Cos } b.\ \text{Sin } (H-S)} = \frac{C}{V}$$

Substituting values,

$$\tan y = \frac{4.9930575 \times \text{Sin } 1°.3043226 \times \text{Sin } 61°.057875}{4.9930575 \times \text{Cos } 1°.3043226 \times \text{Sin } 70°.986}$$

$$= \frac{4.9930575 \times 0.0227627 \times 0.8751089}{4.9930575 \times 0.9997408 \times 0.945439}$$

$$= \frac{0.0991611}{4.9930575} = 0.0210749$$

$$y = 1°.2073247 \text{ or } 1°\ 12'\ 26''$$

Since C and V are both positive, the latitude is NORTHERN.

So the Geocentric Latitude of Guru at the time of the birth of Sri Rama at 10h. 47m. 48secs. (LMT) at Ayodhya, India or 5h. 22m, 12 secs. (GMT) on the 11th February, 4433 B.C., is 1° 12′ 26″.3 (North)

SUKRA.

To find the longitude and latitude of Sukra at 17h. 23m. 5 secs.LMT. at Ayodhya, India, i.e., Noon, Greenwich on the 11th February, 4433 B.C.

SECTION I.

(a) The columns denoted by L, g and U in the following tables give the values of the Mean Longitude, Mean Anomaly and the Mean Argument of Latitude, of Sukra for centuries. These are prepared from the following formulae.

(b) Let L be the mean longitude of Sukra in its undisturbed orbit.
Let g be the mean anomaly.
Let U be the argument of latitude.
Let T be the time reckoned in the Julian centuries of 36525 days from the epoch 3200 B.C., January, 0.5 day i.e.,Noon, Greenwich.

(1) $L = 282^\circ.18561 + 210669162''.88T + 1''.1148T^2$ 341.97032

(2) $g = 223^\circ.83111 + 210664093''.95T + 4''.63T^2$. 214.34622

(3) $U = 252^\circ.31206 + 210665923''.42T + 0''.3612T^2$ 266.59425

(c) Now in the motion of L, putting $l = 210669162''.88T$, we have
for one century of 25 leap years, $l = (162_r)\ 199^\circ\ 12'\ 42''.88$
for one ordinary year of 365 days, $l = (1_r)\ 224^\circ\ 47'\ 29''.676966461$

for one hour of 365 days, $l = 0^\circ\ 4'\ 0''.32531$.

(d) In the motion of g, putting $a = 210664093''.95T$, we have.
for one century of 25 leap years, $a = (162_r)\ 197^\circ\ 48'\ 13''.95$.
for one ordinary year of 365 days, $a = (1_r)\ 224^\circ\ 46'\ 39''.022361396$

(e) In the motion of U, putting $b = (162_r)\ 198^\circ\ 18'\ 43''.42$.
for one century of 25 leap years, $b = (162_r)\ 198^\circ\ 18'\ 43''.42$.
for one ordinary year of 365 days, $b = (1_r)\ 224^\circ\ 46'\ 57''.311383984$
(r stands for one complete revolution of 360 degrees).

SUKRA.

TABLE 1.

SECTION II.

Abbreviation	L	g	U
Explanation	Mean Longitude	Mean Anomaly	Argument of latitude
Motion per century	199°.21191	197°.80387	198°.31206
B.C.Years	o	o	σ
3200	282.18561	223.83116	252.29793
3300	82.973701	26.027278	90.60999
3400	243.76179	188.2234	288.92205
3500	44.549881	350.41952	127.234111
3600	205.33797	152.61564	325.54617
3700	6.12606	314.81176	163.85823
3800	166.91416	117.00788	2.17029
3900	327.70224	279.204	200.48235
4000	128.49033	81.400118	38.79441
4100	289.27842	243.59624	237.10647
4200	90.06651	45.792358	75.41853
4300	250.8546	207.98848	273.73059
4400	51.642691	10.184658	112.04265
4500	212.43078	172.38072	310.35471
4600	13.218871	334.57684	148.66677
4700	174.00696	136.77296	346.97883
4800	334.79505	298.96908	185.29089
4900	135.58314	101.1652	23.60296
5000	296.37123	263.36132	221.91501

The perpetrator of a sinful deed inevitably reaps its terrible consequence when the time occurs even as a tree puts forth its blossom in the proper season.

- Aranya Kanda - Canto 29 - Verse 8

SUKRA

TABLE 2.

Secular Variation

B.C. Years	L	g	U
	o	o	o
3200	0.8056	3.344444	0.26097
3300	0.962	3.472222	0.27131
3400	1.1184	3.599999	0.28185
3500	1.2748	3.727777	0.29259
3600	1.4312	3.855555	0.30353
3700	1.5876	3.983332	0.31467
3800	1.7444	4.111111	0.32601
3900	1.9004	4.238888	0.33755
4000	2.0568	4.366666	0.34929
4100	2.2132	4.494444	0.36123
4200	2.3696	4.622222	0.37337
4300	2.526	4.749999	0.38571
4400	2.6824	4.877777	0.39825
4500	2.8388	5.005555	0.41099
4600	2.9952	5.133333	0.42393
4700	3.1516	5.261109	0.43707
4800	3.308	5.388888	0.45041
4900	3.4644	5.516665	0.46415
5000	3.6208	5.644444	0.477789

Charity, sacrificial performances, as well as offering oblations into the sacred fire, nay, austerities practised and the Vedas studied have their foundation on birth. Hence one should remain devoted to truth.

- Ayodhya Kanda - Canto 109 - Verse 14

SUKRA

SECTION III.

(a) Calculation of Equation of Centre of Venus: 'f':

(i) Extract from Table 7 of C.G.Rajan's Tables of Planet Venus.

g	(0)g	(¼)g	(½)g	(¾)g	(1)g	g
o	o ' "	o ' "	o ' "	o ' "	o ' "	o
96	0 46 36	0 46 34	0 46 33	0 46 31	0 46 30	263
97	0 46 30	0 46 28	0 46 27	0 46 25	0 46 23	262

Therefore, for g = 262°.89585, f_1 = −0°.7748 (by rule of three)

(ii) Extract from Table 8 for Secular Variation of the Equation of Centre of Venus: 'f_2'.

g	f_2	g
o	"	"
97	20	263
98	19	262

Therefore, for g = 262°.89585, f_2 = 0°.0055 (by rule of three)

$f = f_1 + f_2 = -0°.7748 + -0°.0055 = -0°.7803$

(b) Radius Vector of Venus: for g = 262.89585

Extract from Table 13 of C.G.Rajan's Tables of Venus:

g	(0)g	(½)g	(1)g	g
o				o
96	0.72389	0.72394	0.73397	263
97	0.72397	0.72402	0.72406	262

Therefore, for g = 262°.89585, r = 0.72325 (by rule of three)

> *The proverb is often quoted in the world that surely honey does not flow from a Neem tree.*
>
> *-Ayodhya Kanda - 35*
> *Verse 17*

SUKRA.

(C) Calculation of Reduction to the Ecliptic of Venus in seconds of Arc

1. Argument of latitude of Sukra, U 0°.0444
2. Adding secular Variation correction of 0°.39825, we get 0°.44265
3. Adding equation of centre, 'f' i.e., −0°.7803, we get 359°.66235
4. When U is greater than 180°, subtract 180° from it,
   take the remainder and apply the following table.
   'M' is negative since U is between 270 and 360 deg.
5. Extract from Table 9 of C.G.Rajan's Tables of Venus:

U	(0)U	(½)U	(1)U	U
0	0° 0′ 0″	0° 0′ 01″	0° 0′ 03″	179

Therefore, for U = 359.66235, 'M' = 0°.0005627 by rule of three.

Note: The secular variation of the reduction to the ecliptic has not been taken into consideration as it is very negligible.

(d) **Calculation of Heliocentric latitude of Venus 'b':**

We have seen from above that U after correction is 359°.66235
Since it is greater than 180°, subtract 180° and we get 179°.66235.

Extract from Table 10 of C.G.Rajan's Table of Venus:

Latitude of Venus: 'b_1'

U	(0)U	(½)U	(1)U	U
0	0° 0′ 0″	0° 01′ 47″	0° 3′ 33″	179

Therefore for U of 359°.66235 'b_1'= 0°.0199776 (by rule of three)

Since U is greater than 180 degrees, it is negative.

(e) **Calculation of secular Variation of latitude in seconds: 'b_2'**

As per Table 11 of C.G.Rajan's Tables of Venus, b_2 is nil for 179°. (f) Since b = b_1 + b_2, 'b' is −0°.0199776

SUKRA

SECTION IV.

Abbreviation Explanation	L Mean Longitude	g Mean Anomaly	U Mean Argument of latitude.
	o	o	o
Movement per century	199.21191	197.80387	198.31206
Movement per year of 365 days	224.79158	224.77751	224.78259
Mean daily motion	1.6021306	1.6021306	1.6021361

Sl. No.	Description			
1.	Mean longitude on 3200 B.C. (Table 1)	282.18561	223.83116	252.29793
2.	Movement in 12 centuries, i.e., from 3200 to 4400 B.C.	230.54291	213.64644	219.74472
3.	Subtracting (2) from (1)	51.64269	10.184658	112.04265
4.	Movement in 33.115068 years (for 33 years and 42 days)	243.98846	247.83342	248.00175
5.	Adding (3) and (4)	295.63113	258.01808	0.0444
6.	Secular variation (Table 2)	−2.6824	4.87777	0.39825
7.	Adding (5) and (6)	292.94873	262.89585	0.44265
8.	Equation of centre 'f' Section III (a)	−0.7803	–	−0.7803
9.	Reduction to the ecliptic 'M' Section III (c)	0.0005	–	–
10.	Adding algebraically (7), (8) and (9)	292.16893	262.89585	359.66235

SUKRA

SECTION V.

Conversion of Heliocentric longitude into Geocentric longitude.

1.	Longitude of Sun, 'S'	9°.0
2.	Radius Vector of Sun, 'R'	0 .98347
3.	Heliocentric longitude of Sukra 'H' (Section IV)	292°.16893
4.	Radius Vector of Sukra 'r' (Section III (b)	0°.72325
5.	Heliocentric latitude of Sukra 'b' (Section III (d)	0°.0199776

(b) To find the Geocentric longitude of Sukra, the formula is,

$$\tan P = \frac{r.\cos b.\ \mathrm{Sin}\ (H-S)}{R + r.\cos b.\ \mathrm{Cos}\ (H-S)} = \frac{V}{W}$$

Substituting values, $(H-S) = 283°.16893$

$$\tan P = \frac{0.72325 \times \mathrm{Cos}\ 0°.0199776 \times \mathrm{Sin}\ 283°.16893}{0.98347 + 0.72325 \times \mathrm{Cos}\ 0°.0199776 \times \mathrm{Cos}\ 283°.16893}$$

$$= \frac{0.72325 \times \mathrm{Cos}\ 0°.0199776 \times -0.973702}{0.98347 + 0.72325 \times 0.999999 \times 0.2278228}$$

$$= \frac{-0.7042299}{1.1482429} = -0.6133109 \qquad P = 31°\ 521244$$

Since V is negative and W is positive, subtracting from 360°

we get P as	328°.47876
Longitude of Sun	9°.0
Adding we get	337°.47876
Ayanamsa for 4433 B.C.	19°.965
Adding we get Nirayana Longitude, at 17h. 23m. 5s.	357°.44376

Less for the movement of Sukra in 6.58 hours at 0°.0667554 per hour for the birth time of Sri Rama at 10h. 47m. 48secs. (LMT)	0°.4392508
Subtracting	357°.00451
Longitude of Sukra at the birth time of Sri Rama as given by Valmiki	357°.00

The difference is only a few seconds i.e., 16".24 and is negligible.

Even Yama, the God of death, Kubera, son of Visrava, the God of riches, Indira, the ruler of Gods and the very mighty Varuna, the deity presiding over water, can be outstripped by a king of excellent conduct by virtue of such conduct as he combines in his person, all the great virtues of the great.

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SUKRA

SECTION VI.

To find the Geocentric Latitude of Sukra:

In Section III (d) we got the value of heliocentric latitude of Sukra as $-0°.0199776$.

Since P is 328°.047874 and near 360°, the formula to be employed is

$$\tan y = \frac{r.\ \text{Sin } b.\ \text{Cos } P}{0.98347 + r.\ \text{Cos } b.\ \text{Cos } (H-S)} = \frac{D}{W}$$

Substituting values,

$$= \frac{0.72325 \times \text{Sin } 0°.0199776 \times \text{Cos } 328°.47874}{0.98347 + 0.72325 \times \text{Cos } 0°.0199776 \times \text{Cos } 283°.16843}$$

$$= \frac{0.72325 \times 0.00031486 \times 0.8524462}{0.98347 + 0.72325 \times 0.999999 \times 0.2278143}$$

$$= \frac{0.0001941}{1.1482365}$$

$$= 0.000169$$
$$y = 0°.009685$$
$$= 0°\ 0'\ 34''.87$$

Since D and W are both positive, the latitude is Northern.

So the Geocentric Latitude of Sukra,
at the time of birth of Sri Rama
at 10h. 47m. 48secs. (LMT)
at Ayodhya, India or
5h. 22m. 12 secs. G.M.T.,
on the 11th February, 4433 B.C. is
0° 0° 34".87 (North)

SANI

To find the longitude and latitude of Sani at 17h. 23m. 5sec. (LMT) at Ayodhya,India,i.e., Noon, Greenwich on the 11th February, 4433 B.C.

SECTION I.

(a) The columns denoted by L,g, and U in the following tables give the values of Mean Longitude, Mean Anomaly and the Mean Argument of Latitude of Saturn for centuries. These are derived from the following formulae.

(b) Let L be the mean longitude of Sani in its undisturbed orbit.
Let g be the mean anomaly.
Let U be the argument of latitude.
Let T be the time reckoned in Julian centuries of 36525 days from the epoch 3200 B.C., January,0.5 day i.e., Noon Greenwich.

~~25·47988~~ 26'90483

(1) $L = 147^\circ.9623 - 4404635''.581T - 1''.16835T^2 - 0''.021T^3$

(2) $g = 156^\circ.74269 - 4397585''.284T - 1''.80655T^2 - 0''.0376T^3$

(3) $U = 79^\circ.704558 - 4401492''.0785T - 1''.7162T^2 - 0''.0019T^3$

(c) Now in the motion of L, putting $l = 4404635''.581T$, we have,
for one century of 25 leap years $l = 143^\circ\ 30'\ 35''.581$
for one ordinary year of 365 days $l = 12^\circ\ 13'\ 36''.207722519$
for one hour of 365 days a year $l = 0^\circ\ 0'\ 5''.02468$.

(d) In the motion of g, putting $a = 4397585''.284T$, we have,
for one century of 25 leap years $a = (3_r)\ 141^\circ\ 33'\ 4''.884676715$
for one ordinary year of 365 days $a = 12^\circ\ 12'\ 25''.753009179$

(e) In the motion of U putting $b = 4401492''.0785T$, we have,
for one century of 25 leap years, $b = (3_r)\ 142^\circ\ 38'\ 12''.0785$
for one ordinary year of 365 days $b = 12^\circ\ 13'\ 4''.794213621$.
(r stands for one complete revolution of 360 degrees).

~~g = 134·49236~~ L = 260·46036
~~U = 3·88066~~ g = 172·74219
U = 152·43062

SATURN SECTION II.

SANI

TABLE 1.

Abbreviation Explanation	L Mean Longitude	g Mean Anomaly	U Argument of latitude
Motion per century	143°.50988	141°.55147	142°.63669
B.C. Years	o	o	o
3200	147.9623	156.74269	79.704558
3300	4.45242	15.19122	297.06788
3400	220.94254	233.63975	154.43118
3500	77.432666	92.08828	11.794488
3600	293.92278	310.53681	229.1578
3700	150.4129	168.98534	86.521108
3800	6.91302	27.43387	303.88442
3900	223.39314	245.8824	161.24773
4000	79.88326	104.33093	18.611038
4100	296.37338	322.77946	235.97435
4200	152.8635	181.22799	93.337658
4300	9.35362	39.67652	310.70097
4400	225.84374	258.12505	168.06428
4500	82.333823	116.57358	25.427588
4600	298.82394	335.02211	242.7909
4700	155.31406	193.47064	100.15421
4800	11.804183	51.91917	128.81623
4900	228.2943	270.3677	174.88083
5000	84.784423	128.8162	32.244138

SATURN.

Table 2.

Secular Variation - Part 2.

B.C. Years	L	g	U
	o	o	o
3200	0.8438888	0.6952777	1.2397222
3300	0.8944331	0.6446221	1.287877
3400	0.9458075	0.5931365	1.3368832
3500	0.9977319	0.054145	1.3867087
3600	1.0504863	0.489797	1.4373642
3700	1.1040706	0.437979	1.4881297
3800	1.158205	0.385364	1.5397252
3900	1.2131694	0.332548	1.5914307
4000	1.2636387	0.278902	1.6439662
4100	1.3250281	0.225257	1.6966117
4200	1.3819725	0.171511	1.7500872
4300	1.4394168	0.116936	1.8036727
4400	1.4976824	0.06226	1.8578277
4500	1.5398489	0.117036	1.9123532
4600	1.5992232	0.172641	1.9677087
4700	1.6760941	0.228347	2.0231742
4800	1.7701816	0.284882	2.074697
4900	1.8814826	0.341518	2.1367052
5000	2.0102833	0.398984	2.1939407

Who on earth will nurture a Neem tree, while felling down a mango tree with an axe; and a Neem tree will not turn sweet for him who nourishes it with milk

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SATURN.

Table 3.

Secular Variation - Part 2.

B.C. Years	L	g	U
	o	o	o
3200	1.7738889	2.3855556	1.07
3300	1.8021426	2.4683332	1.0741946
3400	1.8303964	2.5541658	1.0785559
3500	1.8586501	2.6424983	1.083056
3600	1.8869038	2.7338871	1.0877228
3700	1.9151575	2.828331	1.0925863
3800	1.9434113	2.9255526	1.0985286
3900	1.971665	3.0258292	1.1036676
4000	1.9999187	3.1286057	1.1089454
4100	2.0281724	3.2349934	1.1158908
4200	2.0564262	3.3441588	1.123002
4300	2.0846799	3.4561019	1.1302526
4400	2.1129336	3.5711	1.1376699
4500	2.1411873	3.688598	1.1464452
4600	2.1694411	3.8097072	1.1554172
4700	2.1976948	3.8238721	1.164528
4800	2.2259485	3.975814	1.1738055
4900	2.2542022	4.1308109	1.1832218
5000	2.282456	4.2879605	1.1928048

The seers of Vedic Mantras as well as gods have respected truthfulness alone. Indeed a verocious man in this world attains the highest realm, which knows no decay.

- Ayodhya Kanda - Canto 109 - Verse 11

SANI.

(C) Calculation of Reduction to the Ecliptic in seconds of arc: 'M'

Argument of latitude, 'U'	= 125°.22565
Equation of Centre, 'f'	= −3 .4059979
Adding algebraically	121°.61965

Extract from Table 12 of C.G. Rajan's Tables of Saturn.

Reduction to the ecliptic ,'M':

U	M
°	″
121	87
122	88

Therefore for 121°.81965,'M' = −87″.81965 or −0°.0243943 (by rule of three) When U is between 90 and 180 deg., M is negative.

(d) Calculation of Heliocentric Latitude of Saturn:

Extract from Table 13 of C.G.Rajan's Tables of Saturn:

Latitude of Saturn — 'b'

U	b
°	″
121	2° 8′ 10″
122	2° 6′ 47″

Therefore for U = 121°.81965, b = 2°.1172136 or 2° 07′ 1″.97 when U is between 0 and 180 deg., b is positive or northern.

In a rulerless land festivals in honour of deities in which actors and dancers exhibit their art in a highly escatatic mood and connival gatherings promoting the welfare of the State do not gather strength.

- Ayodhya Kanda - Canto 67 - Verse 15

SANI.

SECTION III.

(a) Calculation of Equation of Centre of Saturn, 'f ':

In Section IV, we get the value of 'g' as 214.2836.
Extract from Table 9 of C.G.Rajan's Tables of Sani:

Equation of Centre, 'f_1'

g	f_1	g
o	"	"
145	3° 28' 22"	215
146	3° 23' 02"	214

when 'g' is between 180 and 360 deg., 'f_1' is negative.
Therefore, for g of value 214°.2836, 'f_1' = −3°.3838889
(by rule of three)

Extract from Table 10 of C.G. Rajan's Tables of Saturn, 'f_2':

Secular Variation of the

Equation of Centre of Saturn, 'f_2'.

g	f_2	g
o	"	"
145	81	215
146	79	214

When g is between 180 and 360 deg., 'f_1' is negative.
Therefore, for 'g' as 214.2836, 'f_2' = 79". 592409 or −0°.022109
f = 'f_1' + 'f_2'. So 'f' = −3°.3838889 + −0°.022109 = −3°.4059979.

(b) To find out the Radius Vector of Saturn for g = 214°.2836.
Extract from Table 14 (a) of C.G.Rajan's Tables of Saturn.

Radius Vector of Saturn.

g	r	g
145	10.00138	215
146	10.00618	21

Therefore, for g = 214°.2836, r = 10.004819 (by rule of three)

SATURN. SECTION IV

Abbreviation Explanation	L Mean Longitude	g Mean Anomaly	U Mean Argument of latitude.
	o	o	o
Movement per century	143.50988	141.55147	142.63669
Movement per year	12.226725	12.207153	12.217997
Daily motion	0.0334972	0.0334444	0.033473
1. Mean longitude on 3200 B.C. 0.5 day.	147.9623	156.74269	79.704558
2. Movement in 12 centuries i.e., from 3200 to 4400 B.C.	282.11856	258.61764	271.64028
3. Subtracting for mean longitude on 4400 B.C. (Table 1)	225.84374	258.12505	168.06428
4. Movement in 33.1342465 leap years	45.123314	44.47481	44.834118
5. Subtracting for mean longitude on 11.22.4433 B.C,	180.72043	213.65024	123.23016
6. Correction for Secular Variation – Part 1 (Table 2)	1.49824	0.0622605	1.8578277
7. Correction for Secular Variation – Part 2 (Table 3)	2.1129336	3.5711	1.1376699
8. Constant Correction	–	– 3.0	– 1.0
9. Equation of Centre, 'f' Section III (a)	– 3.4059979	–	– 3.4059979
10. Reduction to the ecliptic Section III (c)	0.0243943	–	–
11. Adding (5) to (10) algebraically	180.95	214.2836	121.81965

SATURN SECTION V.

Conversion of Heliocentric longitude into Geocentric longitude:

(a) 1. Longitude of Sun, 'S' 9° 0

2. Radius Vector of Sun, 'R' 0 .98347

3. Heliocentric Longitude of Saturn, H180°.95

4. Radius Vector of Saturn, 'r' 10 .004819

5. Heliocentric latitude of Saturn 'b' 2°.1172136

(b) To find the geocentric longitude of Saturn, the formula is

$$\tan P = \frac{r.\cos b.\ \text{Sin}\,(H-S)}{R + r.\cos b.\ \text{Cos}\,(H-S)} = \frac{V}{W}$$

Substituting values, $(H-S) = 180°.95 - 9°.0 = 171°.95$

$$\tan P = \frac{10.004819 \times \text{Cos}\ 2°.1172136 \times \text{Sin}\ 171°.95}{0.98347 + 10.004819 \times \text{Cos}\ 2°.1172136 \times \text{Cos}\ 171°.95}$$

$$= \frac{10.004819 \times 0.9993173 \times -0.9901482}{0.98347 + 10.004819 \times 0.9993173 \times -0.9901482}$$

$$= \frac{1.4000903}{-8.9160013} = -0.1570311 \quad P = 8°.9243461$$

Since V is positive and W is negative, P = 180 − a.

So 180°.00 − 8°.9243461 =	171°.07565
Sun's longitude	9°.0
Adding	180°.07565
Ayanamsa for 4433 B.C.	19°.965
Adding	200°.04065
Movement of Saturn in 6.58 hours at 0°.001394 per hour for the birth time of Sri Rama at 10h. 47m. 48 secs. (LMT)	0°.00917
Subtracting	200°.03148
Longitude of Saturn at the time of Sri Rama's birth as given by Valmiki	200°.00

Note: The difference is very negligible.

SATURN

SECTION VI.

To find the geocentric latitude of Saturn:

In Section III (d) we got the value of heliocentric longitude of Saturn as 2°.1172136 (North)

Since P is 171°.07565 and between 135 and 225°, the following formula becomes applicable.

$$\tan y = \frac{r.\ \text{Sin}\ b.\ \text{Cos}\ P}{R + r.\cos b.\ \text{Cos}\ (H - S)} = \frac{D}{W}$$

Substituting values,

$$\tan y = \frac{10.004819 \times \text{Sin}\ 2^\circ.1172136 \times \text{Cos}\ 171^\circ.07565}{0.98347 + 10.004819 \times \text{Cos}\ 2^\circ\ 1172136 \times \text{Cos}\ 171^\circ.95}$$

$$= \frac{10.004819 \times 0^\circ.0369439 \times -0.987894}{0.98347 + 10.004819 \times 0.9993173 \times -0.9901462}$$

$$= \frac{-0.3651424}{8.916005} = 0.0409536$$

y = 2.3451584 i.e., 2° 20′ 42″.5

Since D and W are both negative, the latitude is Northern.

So the geocentric latitude of Saturn
at the time of Sri Rama's birth
at 10h 47m. 48 secs., (LMT) A.M.
at Ayodhya, India or 5h. 22m. 12s. GMT
on the 11th February, 4433 B.C.
is 2° 20′ 42″.5 (North).

CHAPTER VI.

SALIENT FEATURES IN THE HOROSCOPE OF SRI RAMA.

1.	Name	:	SRI RAMA
2.	Place of birth	:	Ayodhya, India Longitude; 81° 24′ (East) Latitude; 26° 48′ (North)
3.	Year of birth	:	4433 B.C. -1331 Kali Baarhaspatya Varsha, Prabhava
4.	Date of birth	:	11th February, 4433 B.C. Prabhava, Chaitra, Sukla Navami
5.	Julian Day	:	102311
6.	Time of birth	:	13 Ghatikas 10 hours, 47 min., 48 secs. L.M.T.
7.	Siderial Time	:	23 hours, 09 min., 13 secs. (Notional)
8.	Week day of birth	:	Sunday
9.	Janma Lagna	:	Karkataka
10.	Janma Cusp	:	90° 00′ 01″
11.	Janma Nakshatra	:	Punarvasu, 4th Pada
12.	Balance in Mahadasa	:	4 years in Guru Maha Dasa
13.	Nadi amsa at birth	:	Vasudha
14.	Sun Rise	:	5 hours, 35 min., 48 secs. A.M., L.M.T.
15.	Sun Set	:	6 hours, 28 min., 48 secs. P.M., L.M.T.
16.	Ahas	:	32 Ghatikas, 12 Vighatikas
17.	Ratri	:	27 Ghatikas, 48 Vighatikas
18.	Ayanamsa	:	19° 57′ 54″ or 19°.965

Planets

Ravi	90°0'0"	Guru	90°0'1"
Chandra	90°0'1"	Shukra	357°0'0"
Kuja	298°0'0"	Shani	200°0'0"
Budha	21°0'0"	Lagna	90°0'1"
Rahu	120°4'26'	Ketu	300°4'26"

POSITION OF PLANETS IN E HOROSCOPE OF SRI RAMA

Planets	Nirayana Longitude o	′	″	Rasi	Constellation
Lagna	90	00	01	Karkataka	Punarvasu 4
Ravi	9	00	00	Mesha	Aswini 3
Chandra	90	00	01	Karkataka	Punarvasu 4
Kuja	298	00	00	Makara	Dhanishta 2
Budha	21	00	00	Mesha	Bharani 3
Guru	90	00	01	Karkataka	Punarvasu 4
Sukra	357	00	00	Meena	Revati 4
Sani	200	00	00	Tula	Swati 4
Rahu	120	4	26	Simha	Aslesha 1
Ketu	300	4	26	Kumba	Dhanishta 3

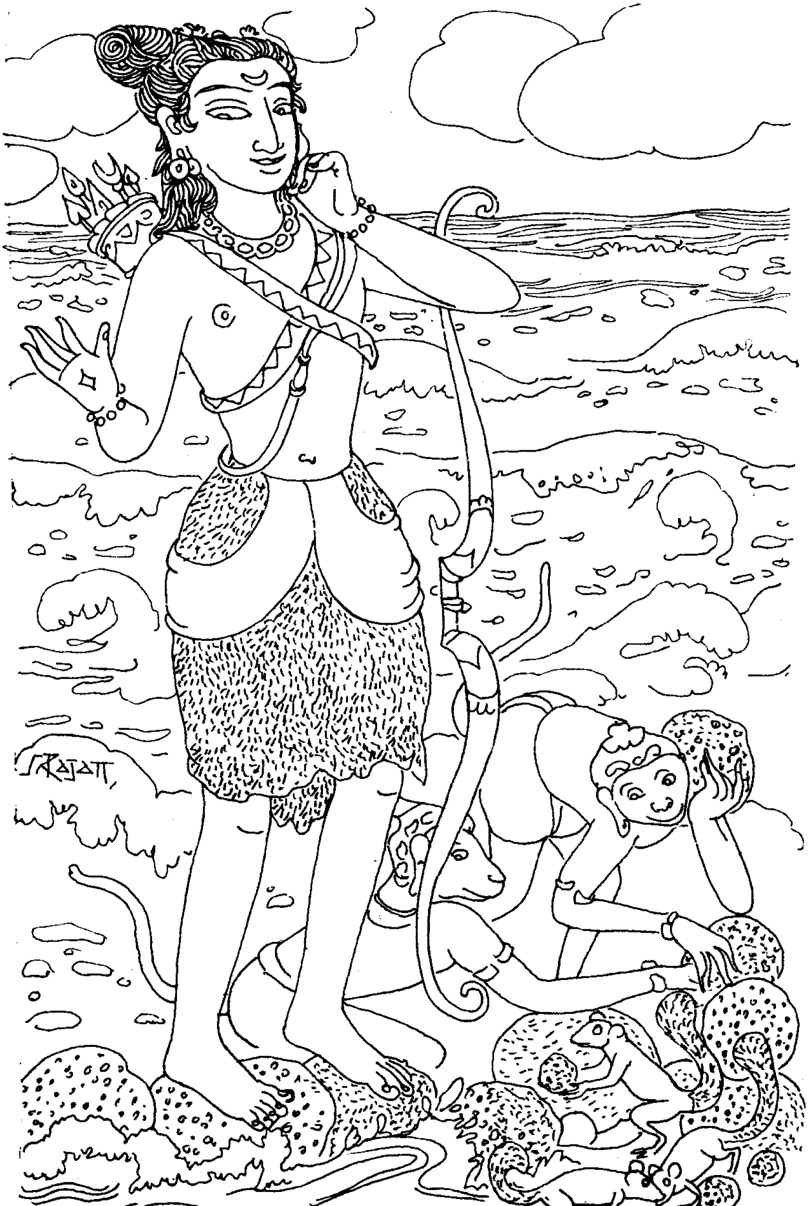
<table>
<tr><td>Sukra</td><td>Ravi
Budha</td><td></td><td></td></tr>
<tr><td>Ketu</td><td colspan="2" rowspan="2">RASI
CHAKRA
OF
SRI RAMA</td><td>LAGNA
Chandra
Guru</td></tr>
<tr><td>Kuja</td><td>Rahu</td></tr>
<tr><td></td><td></td><td>Sani</td><td></td></tr>
</table>

BHAVA CHAKRA

Indian astrology speaks of Udaya Lagna and also Bhava Chakra (or the houses) with references to which alone astrological predictions have to be made according to its strict rules and dogmas. Further the Indian astrology advocates the method of making the ecliptic into twelve divisions (houses) with reference to the latitude of the place of birth and the time of birth. This division was in practice during the time of Rama also. Indian astrology condemns the practice of blindly taking the zodiacal signs of equal magnitude of 30° to represent bhavas. While a zodiacal sign is uniformly 30° long, a bhava is of varying magnitude and becomes shorter in higher latitudes. So our next main task is to erect the Bhava Chakra of Sri Rama. To erect the Bhava Chakra, the Udaya Lagna and the cusps of several other Indian bhavas are required. To calculate these, the siderial time at the time of birth is essential. We can then calculate these cusps from "The Tables of Houses" by Raphael. This book gives the tropical longitudes of the several cusps of European Bhavas for the different latitudes. But we do not know the Siderial Time at the time of birth of Sri Rama. Instead we know the end result i.e., the longitude of the Udaya Lagna, correct to the second. So we can calculate (by proportion i.e., rule of three) the corresponding Siderial Time by reversing the process of calculation. From Raphael's Tables we get the following figures for the Ascendant for 26° 51' (N).

	Ascendant	Siderial Time
	90° 40'	23h. 12m. 10s.
	89° 50'	23h. 8m. 28s.
Difference	50' or 3000 secs.	3m. 42s. of 222 secs.

For the birth time of Sri Rama, the corresponding siderial time is 23h. 9m. 13s. Having got the siderial time, we can now calculate the positions of the other cusps for this siderial time, direct in Nirayana longitudes, from Raphael's Tables of Houses.


S.Rajam

Siderial Time	Cusps 10th	11th	12th	Ascdt.	2nd	3rd
h. m. s.	°	°	°	° ′	°	°
23 12 10	347	21	57	90 40	114	138
23 8 28	346	20	56	89 50	113	137
3 42	1	1	1	50	1	1
23 9 13	346° 12′	20° 12′	56° 12′	90° 0′ 1″	113° 12′	137° 12′

Getting these cusps directly in Nirayana longitude by finding out the corresponding siderial time with the help of the Nirayana longitude of the Udaya Lagna, given by Valmiki, is as good as getting these in European cusps for the actual and siderial time and adopting the Ayanamsa. Our results do not at all get altered or affected in any way. In short, all that we have done from Raphael's Tables is we have found out the corresponding cusps of the other bhavas to the ascendant, since we know the Nirayana longitude of the Ascendant, correct to the arc of second.

Having got thus the cusps of the six bhavas, it is easy to erect the Bhava Chakra. If we add 180 degrees to all these cusps, Viz., Ascendant, 2nd, 3rd, 10th, 11th and 12th, we get the cusps of the 4th, 5th, 6th 7th, 8th and 9th bhavas, as given in the following Table.

Number of Indian Bhava	Arambha Sandhi (Beginning of the bhava)	Virama Sandhi (Ending of the bhava)
	° ′ ″	° ′ ″
1st	90 00 01	113 12 00
2nd	113 12 00	137 12 00
3rd	137 12 00	166 12 00
4th	166 12 00	200 12 00
5th	200 12 00	236 12 00
6th	236 12 00	270 00 01
7th	270 00 01	293 12 00
8th	293 12 00	317 12 00
9th	317 12 00	346 12 00
10th	346 12 00	20 12 00
11th	20 12 00	56 12 00
12th	56 12 00	90 00 01

Valmiki has not left to his posterity any doubt about the beginning of the bhavas. He has clearly stated that the beginning of the 1st bhava is 90° 00′ 01″. The beginning of the 2nd bhava is the ending of the 1st bhava.

This automatically eliminates the following doubts in some quarters.

1. Whether the longitude of Udaya Lagna is mid point.
2. Whether the mid point is the beginning of the particular bhava.
3. Whether the beginning point is the average of the mid point of the particular bhava and the mid point of its previous bhava.

9th bhava 317° 12′	10th bhava 346° 12′ Sukra Ravi	11th bhava 20° 12′ Budha	12th bhava 56° 12′
Ketu 8th bhava 293° 12′	BHAVA CHAKRA OF SRI RAMA		1st bhava 90° 00′ 01″ Lagna Chandra Guru
7th bhava 270° 12′			2nd bhava 113° 12′ Rahu
6th bhava 236° 12′	5th bhava 200° 12′	Sani 4th bhava 166° 12′	3rd bhava 137° 12′

Planet	Deity of Shastiamsa	Lord of Shastiamsa	Oradhipathi	Thrimsa adhipathy
Lagna	Indurekha	Ravi	Chandra	Sukra
Ravi	Mridwamsa	Kuja	Ravi	Sani
Chandra	Indurekha	Ravi	Chandra	Sukra
Kuja	Kubera	Sukra	Ravi	Kuja
Budha	Ootpatha	Kuja	Chandra	Budha
Guru	Indurekha	Ravi	Chandra	Sukra
Sukra	Kinnara	Sukra	Ravi	Kuja
Sani	Mukya	Guru	Chandra	Sukra

Quadrants or Kendras	1st Kataka	4th Tula	7th Makara	10th Mesha
Trines or Trikonas	1st Kataka	5th Vrischika	9th Meena	
Panapara or (Succeeding houses)	2nd Simha	5th Vrischika	8th Kumba	11th Vrishaba
Apoklimas or Cadent houses	3rd Kanya	6th Dhanus	9th Meena	12th Mithuna
Oopachayas	3rd Kanya	6th Dhanus	10th Mesha	11th Vrishaba

Truth alone is God in the world, piety ever hinges on truth. All have their root in birth; there is no goal higher than truth.

- Ayodhya Kanda - Canto 109 - Verse 13

Sukra	Ravi Budha		
Ketu	RASI		Lagna Chandra Guru
Kuja	CHAKRA		Rahu
		Sani	

	Ravi-1		
Sani-2	DREKANA		Lagna-1 Chandra — 1 Guru-1
	CHAKRA		
Budha — 3	Sukra — 3		Kuja-3

	Sani		
	CHATURAMSA		Lagna Ravi Chandra Guru
	CHAKRA		
Sukra		Kuja Budha	

Kuja Sukra		Ravi	
	SHASTAMSA		Sani
	CHAKRA		Budha
		Legna Chandra Guru	

Sukra			Ravi
Sani	SAPTAMSA		
Lagna Chandra Kuja Guru	CHAKRA		Budha

	Lagna Chandra Guru		Ravi
	ASHTAMSA		Sukra
	CHAKRA		
	Kuja		Budha Sani

Sukra			
	NAVAMSA		Lagna Chandra Guru Sani
	CHAKRA		
		Budha	Kuja

Lagna Chandra Guru		Kuja	Ravi
	DASAMSA		
	CHAKRA		Sukra
	Budha		

Lagna Chandra Guru	Sani	Kuja	Ravi
	DASAMSA		
	CHAKRA		Sukra
	Budha Ketu		

		Sukra	Lagna Chandra Guru
Kuja	EKADASAMSA		
	CHAKRA		Budha
Ravi			

		Sani	
	DWASAMSA		Lagna Ravi Chandra Guru
Sukra	CHAKRA		
Kuja Budha			

Budha	Lagna Chandra Guru		Kuja
Sukra Sani	SHODASAMSA		
	CHAKRA		Ravi

CHAPTER VII

CACULATION OF SHAD BALA IN

SRI RAMA'S HOROSCOPE.

SALIENT FEATURES IN THE HOROSCOPE OF SRI RAMA:

1.	Name	: SRI RAMA
2.	Place of birth	: Ayodhya, India Longitude 81° 24′ (East) Latitude 26° 48′ (North)
3.	Period	: Shristiyadi 28th Mahayuga Vaivasvata Manvantra, Treta-Dwapara Sandhi
4.	Year of Birth	: – 1331 Kali Year Baarhaspatya Varsha PRAHBHAVA 4433 B.C.
5.	Date of Birth	: 11th February, 4433 B.C. By English Calendar. Prabhava Varsha, Chaitra, Sukla Julian Day 102311 Navami
6.	Time of birth	: 13 Ghatikas 10 hours, 47 minutes, 48 seconds Local Mean Time
7.	Day of Birth	: Sunday
8.	Janma Lagna	: Karkataka
9.	Janma Cusp	: 90° 00′ 01″
10.	Janma Nakshatra	: Punarvasu, 4th Pada
11.	Balance in Mahadasa	: 4 years in Guru Mahadasa
12.	Nadi Amsa at birth	: Vasudha
13.	Sunrise	: 5 hours, 35 min. 48 secs. A.M. LMT
14.	Sunset	: 6 hours, 28 min. 48 secs. P.M. LMT
15.	Ahas	: 32 Ghatikas, 12 Vighatikas

16. Ratri	: 27 Ghatikas, 48 Vighatikas
17. Ayanamsa	: 19°.965
18. Kendra or Quadrants	: Karkataka (1st), Tula (4th), Makara (7th) and Mesha (10th)
19. Trines or Trikonas	: Vrishchika (5th), Meena (9th) and Karkataka (1st)
20. Panapara	: Simha (2nd), Vrishchika (5th), Kumba (8th) and Vrishaba (11th)
21. Apoklimas	: Kanya (3rd), Dhanus (6th), Meena (9th) and Mithuna (12th)
22. Oopachayas	: Kanya (3rd), Dhanus (6th) Mesha (10th) and Vrishaba (11th)

RESIDENTIAL STRENGTH OF THE PLANETS IN SRI RAMA'S HOROSCOPE:

	Ravi	Chandra	Kuja	Budha	Guru	Sukra	Sani
House	10th	1st	8th	11th	1st	10th	5th
Bhaga	Poorva	Poorva	Poorva	Poorva	Poorva	Poorva	Uttara
Longitude in degrees	9.0	90.000	298.000	21.00	90.00	357.00	200.00
Arambha (Virama) Sandhi	20.2	90.000	293.2	20.2	90.00	346.2	200.2
Aramba Sandhi minus Long ie. Arc of Residential strength	11.2	0.000	4.8	0.8	0.0	10.8	0.2
Poorva or Uttara Bhaga of a Bhava in degrees	17.0	11.6	12.0	18.0	11.6	17.00	18.00

Residential Strength Poorva or Uttara-bhaga i.e., Residential Strength	0.66	0.00	0.4	0.04	0.00	0.64	0.01

Use of Residential Strength:

The Residential Strength enables one to judge the exact quantity of effect that a planet in a Bhava gives, which may find expression during its dasa. Its application and usefulness can be gauged from the happenings.

For instance, Sukra gives 0.64 unit of the tenth bhava. This effect will materialise during his Dasa or Bukthi. This is only a general statement standing to be modified in the light of other important factors such as, the strength or the weakness of the planets aspecting the Bhavas, the strength of the Bhava itself and the disposition of planets towards particular signs, the Yoga Karakas etc.

In Chapter VI, we have cast the complete horoscope of Sri Rama according to the rules and strict dogmas of astrology. As we have discussed earlier there is only one Rasi Kundali of Sri Rama in vogue till now, wherein it is shown that five planets are in exaltation and the Lagna is Karkataka with Chandra in that sign. A comparison now to Chapter VI would amaze the reader in having obtained almost all the vargas, charts, etc., required for a complete study of Sri Rama's horoscope.

It is our next job to find out how to apply this information for a study of behaviourisms in giving results.

The strength or bala:

It has been discovered that there are certain behaviourisms amongst planets in their way of giving results. Planets transmit their influences to one another by aspect, conjunction, etc. By virtue of these, they acquire strength or weakness. Now it is our task to identify the sources of strength and quantify them.

Shad Balas:

Sri B.V.Raman has published a book "Graha and Bhava Balas". He has followed the Sripathi padhati as far as possible in his text. The author of this book is much attracted by the method of calculation adopted by Sri B.V.Raman. So it is desired to closely follow the text, in calculating the strength of the planets in Sri Rama's horoscope.

Sources of Strength:

We often hear that a planet is a greater benefic and another is a greater malefic for a native. These statements are partially true. There are six kinds of balas. They are

1. Sthana Bala or positional strength
2. Dik bala or directional strength
3. Kala bala or temporal strength
4. Chesta bala or motional strength
5. Naisargika bala or permanent strength
6. Drik bala or aspect strength.

The above shad balas give an account of strength and weakness of each house and planet in the horoscope like a balance sheet of assets and liabilities.

Sthana Bala:

A planet occupies a certain sign which is friendly, neutral or inimical. It is either exalted or debilitated. It occupies Moolathrikona or is in its own varga. By virtue of these, the planet acquires strength or weakness. This strength or potency is called the Sthana Bala. It consists of

1. Ochcha bala,
2. Saptavargaja bala,
3. Ojayugmarasyamsa bala,
4. Kendra bala and
5. Drekkana bala.

Unit of measure:

The balas of planets are measured in Rupas. A Rupa consists of 60 sashtiamsas.

Ochcha bala:

Ochcha bala is the strength of ochcha or exaltation. All planets have certain exaltation points (Ochchabhagas). When a planet occupies its parama ochchabhaga, it gives one rupa or 60 shastiamsas of ochcha bala. When it occupies neechabhaga (debilitation point) it gives no ochcha bala.' From the neechabhaga to the ochcha baga, there is a gradual increase of the ochcha bala until at last the bala reaches its maximum at the ochchabhaga. From the exaltation point to the debilitation point there is a gradual decrease till the minimum is reached at the Neechabhaga.

It means that when a planet's longitude, diminished by its debilitation point is in excess of 180° it is to be subtracted from 360° and the difference is to be divided by 3. The result represents ochcha bala of the planet in Virupas or Shastiamsas.

That is,

$$\frac{\text{Planet's longitude - Its debilitation point}}{180} \times 60$$

$$= \frac{\text{Planet's longitude - Its debilitation point}}{3}$$

Calculation of ochcha bala in Sri Rama's horoscope:

	Ravi	Moon	Kuja	Budha	Guru	Sukra	Sani
Planet's longtitude in degrees	9.0	90.00	298.00	21.00	90.00	357.00	200.00
Neecha bhaga in deg.	190.00	213.00	118.00	345.00	275.00	177.00	20.00
Difference	181.00	123.00	180.00	36.00	175.00	180.00	180.00
Dividing the above by 3	60.00	41.00	60.00	12.00	58.00	60.00	60.00
Percent	100.00	69.00	100.00	20.00	96.00	100.00	100.00

Moolathrikonadi Bala:

Planets have relations amongst themselves. They have relations with the vargas and bhavas also. Certain planets are friends, neutrals and enemies of certain other planets. There are two types of relationships amongst them. They are Naisargika and Tatkalika.

Naisargika relationship:

This means permanent or natural. A planet is a friend, neutral or enemy of another planet in consequence of its nature. The rays or influence of a planet will be intensified by the rays or influence of the friendly planet and counteracted by the rays or influence of the enemical planet. The naisargika relationships are invariably the same in all horoscopes. A Table of natural relationships between planets is given below.

Permanent Relationship

Planet	Mitras	Sama	Satru
Ravi	Moon, guru, Kuja	Budha	Sani, Sukra
Moon	Ravi, Budha	Kuja, Sani, Guru· Sukra	–
Kuja	Guru, Moon, Ravi	Sani, Ṣukra	Budha
Budha	Ravi, Sukra	Sani, Guru, Kuja	Moon
Guru	Ravi, Moon, Kuja	Sani	Budha, Sukra
Sukra	Budha, Sani	Kuja, Guru	Ravi, Moon
Sani	Sukra, Budha	Guru	Kuja, Moon, Ravi

Tatkalika relationship:

This means temporary or for the time being. As a result of the positions of planets at birth time each stands at a certain relation with the other. The tatkalika relationship changes with reference to the horoscope.

The planets in the second, third, fourth, tenth, eleventh and twelfth houses from any other planet become his Tatkalika friend. Those in the rest of the houses are Tatkalika enemies.

The Tatkalika relationship between the different planets in Sri Rama's horoscope is as follows.

Temporary Relationship

Planet	Tatkalika Mitru	Tatkalika Satru
Ravi	Moon, Guru, Kuja Sukra	Sani, Budha
Moon	Sani, Ravi, Budha	Guru, Kuja, Sukra
Kuja	Sukra, Budha, Sani Ravi	Moon, Guru
Budha	Moon, Guru, Kuja Sukra	Ravi, Sani
Guru	Sani, Ravi, Budha	Moon, Kuja, Sukra
Sukra	Ravi, Budha, Kuja	Moon, Guru, Sani
Sani	Kuja, Moon, Guru	Sukra, Ravi, Budha

Combined or Mixed Relationship:

If a temporary friend also happens to be a permanent friend, they both become intimate friends (Adi Mitras). A temporary friend and a permanent enemy and vice versa becomes a Sama (neutral). A temporary enemy, if he happens to be a permanent enemy becomes a bitter enemy (Adi Satru). Thus we get the following relationships after combining the two, in the horoscope of Sri Rama.

Thus we can see that a planet may be disposed towards another planet as a Mitra, Satru, Sama, Adi Mitra and Adi Satru.

Combined Relationship in Sri Rama's Horoscope:

Planet	Adi Mitru	Mitru	Sama	Satru	Adi Satru
Ravi	Moon, Kuja, Guru	–	Sukra —	Budha	Sani
Moon	Ravi, Budha	Sani	—	Kuja, Guru, Sukra	—
Kuja	Ravi, Sani	Sukra	Ravi, Moon Budha, Guru	–	–
Budha	Sukra	Ravi, Kuja, Guru	Moon	Sani	–
Guru	Ravi	Sani	Moon, Kuja Budha	–	Sukra
Sukra	Budha	Kuja	Ravi, Sani	Guru	Moon
Sani	–	Guru	Moon, Kuja, Budha, Sukra	–	Ravi

Planets and Vargas:

The relationship between planets enable us to determine a part of sthana bala, viz. saptavargaja bala. For instance, in Sri Rama's horoscope Kuja is in Makara and Sani owns Makara. Sani is Ati Mitru to Kuja and so Kuja occupies a sign of Ati Mitru. Thus the relationship of the other planets are determined and given below.

Relationship between planets in Sri Rama's horoscope:

Varga	Ravi	Moon	Kuja	Budha	Guru	Sukra	Sani
Rasi	A.Mitru	Swa.	A.Mitru	Mitru	Sama	Sama	Sama
Hora	A.Mitru	Swa	Sama	Sama	Sama	Sama	Sama
Drekana	A.Mitru	Swa	Sama	Mitru	Sama	Mitru	Sama
Saptamsa	Satru	Mitru	A.Mitru	Mitru	Mitru	Satru	Sama
Navamsa	Satru	Swa.	Sama	A.Mitru	Sama	Satru	Sama
Dwadasamsa	A.Mitru	Swa.	Sama	Mitru	Sama	Sama	Sama
Thrimsamsa	A.Satru	Satru	Swa.	Swa.	A.Satru	Mitru	Sama

Planets occupying more than one swakshetra i.e., varga:

The number of times a planet occupies its own varga the more auspicious it becomes and special results are ascribed to such occupancy of more than one swavarga i.e., swakshetra if a planet occupies its own varga.

Twice it is in	...	Parijatamsa
Thrice "	...	Parvathamsa
Four time "	...	Simhasanamsa
Five " "	...	Swargabalamsa
Six " "	...	Indramsa
Seven " "	...	Rajapadmamsa
Eight " "	...	Gopuramsam
Nine " "	...	Brahpadamsam
Ten " "	...	Vaishvanamsam
Eleven " "	...	Saivamsam
Twelve " "	...	Vaiseshikamsam

Finding out the various amsams in Sri Rama's horoscope:

Moon occupies swakshetra in the following charts:

Rasi, Drekana,
Hora, Navamsa, and Dwadasamsa.

Sani occupies swakshetra in Drekana and Saptamsa. Thus Moon gets Swargabalamsa and Sani parijatamsa.

The other planets have only one swakeshetra and hence they have no special amsas.

Planets and vargas:

The relations between planets and vargas are required. For instance, in Sri Rama's horoscope, Sani is in Tula sign. The lord of tula is Kuja. Kuja is Ati Mitru to Sani. So Sani occupies an Atimitru kshetra or varga. Likewise we have to find out if the other planets occupy their own vargas, enemy's varga, friend's varga, sama varga, ati mitru varga, ati satru varga, in the Rasi, Hora, Drekana, Saptamsa, Navamsa, Dwadasamsa and Thrimsasa charts. Now let us find out these relations in Sri Rama's horoscope.

Relationship between planets in Sri Rama's horoscope:

Planets	Rasi	Hora	Drek-hana	Sapth-amsa	Navam-sa	Dwada-samsa	Thrim-samsa
Ravi	A.Mitru	A.Mit	A.Mit	Satru	Satru	A.Mit	A.Mitr
Moon	Swa	Swa	Swa	Mitru	Swa	Swa	Satru
Kuja	A.Mit	Sama	Sama	A.Mitr	Sama	Sama	Swa
Budha	Mitru	Sama	Mitru	Mitru	A.Mitr	Mitru	Swa
Guru	Sama	Sama	Sama	Mitru	Sama	Sama	A.Satru
Sukra	Satru	Swa	Mitru	Satru	Satru	Sama	Mitru
Sani	Sama	Sama	Swa	Swa	Sama	Sama	Sama

Saptavargaja Bala:

A planet on account of its occupancy of the different vargas gets a certain amount of strength. A planet may occupy a Swavarga, a Mitra varga, Satruvarga or it may occupy a special position of Moolathrikona.

A planet in its special Moolathrikona is assigned a value of 45 Shastiamsas; in Swavarga 30 Shastiamsas; in Adi Mitra varga 22.5 Shastiamsas; in Mitra varga 15 Shastiamsas; in Samavarga 7.5 Shasti amsas; in Satruvarga 3.75 Shastiamsas and Adi Satru varga 1.875 Shastiamsas.

It must be noted that 45 Shastiamsas have to be allotted for a planet only when it is in Moolathrikona rasi and not when it occupies any of the six vargas (than Rasi) owned by the planets. Suppose Budha is in Kanya, in Rasi and Navamsa, he gets 45 Shastiamsas only in the Rasi Varga and not in the other case.

Saptavargaja Balas of planets in Sri Rama's horoscope:

Planets	Ravi	Moon	Kuja	Budha	Guru	Sukra	Sani
Varga							
Rasi	22.500	45.000	22.500	15.000	7.500	3.750	7.500
Hora	30.000	30.000	7.500	7.500	7.500	7.500	7.500
Drekana	22.500	30.00	22.500	15.000	7.500	15.000	30.000
Saptamsa	3.750	15.000	22.500	15.000	15.000	3.750	30.000
Navamsa	3.750	30.000	7.500	22.500	7.500	3.750	7.500
Dwada-samsa	22.500	30.000	7.500	15.000	7.500	7.500	7.500
Thrim-samsa	1.875	3.750	15.000	30.000	1.875	15.000	7.500
Moola Thrikona Bala	106.875	183.750	105.000	120.000	54.375	56.250	97.500

Ojayugmarasyamsa Bala:

This is the strength acquired on account of the occupancy of odd and even rasis and Navamsas. Certain planets get strength by occupying Oja(odd) Rasis or Oja Navamsas while others become powerful by residing in Yugma (even) Rasis or Yugma Navamsas. A planet which is to get strength by staying in an Oja Rasi or Oja amsa is assigned a certain value as also the planets which are to get strength by residing in an Yugma Rasi or Yugma Navamsa.

The Moon and Sukra when they are in an even sign or in a Navamsa owned by an even sign get strength of 15 Shastiamsas. The Sun and Kuja, Budha, and Sani when they are in Oja Rasis or Ojamsas get a strength of 15 Shastiamsas. If, for instance, the Moon stays in a Yugma Rasi and Yugma Navamsa, she acquires a strength of 15 plus 15 i.e., 30 Sashtiamsas. Hence we call this Ojayugmarasyamsa Bala.

Ojayugmarasyamsa Balas in Sri Rama's horoscope:

Planets	Ravi	Moon	Kuja	Budha	Guru	Sukra	Sani
Varga							
Rasi	odd	even	even	odd	even	even	odd
Navamsa	odd	even	even	odd	even	even	even
Rasi Bala	15.00	15.00	0.0	15.00	0.0	15.00	15.00
Navamsa Bala	15.00	15.00	0.0	30.00	0.0	30.00	15.00
Yugma-yugma Bala	30.00	30.00	0.00	30.00	0.0	30.00	15.00

Kendra Bala:

In the Rasivarga, when a planet is in the first, fourth, seventh or tenth house, it is in Kendra Position, and gets 60 Shastiamsas as its Kendra bala. When it is in the second, fifth, eighth, or eleventh house, it is in its Panapara varga and gets 30 Shastiamsas as its strength. When it is in the signs of the third, ninth or twelfth it is in Apoklima varga and gets 15 Sashtiamsas as its strength. All the above three balas must be considered obly in the Rasivarga.

Determination of Kendra Bala in Sri Rama's horoscope:

Planets	Kendra or Panapara or Apoklima	Kendra Bala in Sashtiamsas
Ravi	Kendra	60
Moon	Kendra	60
Kuja	Kendra	60
Budha	Kendra	60
Guru	Kendra	60
Sukra	Apokliya	15
Sani	Kendra	60

Drekkana Bala:

Planets are divided into Masculine (Purusha), Feminine, (Stree) and Hermaphrodite (Napumsaka). A male planet in the first Drekkana gets 15 Shastiamsas of Drekkana Bala, A feminine planet in the 3rd Drekkana gets 15 Sashtiamsas as its Drekkana Bala. A hermaphrodite planet in the second Drekkana gets 15 Sashtiamsas as its Drekkana Bala.

Masculine planets: Ravi, Guru and Kuja.
Feminine planets: Moon and Sukra.
Hermaphrodite planets: Sani and Budha.

Determination of Drekkana Bala in Sri Rama's horoscope:

Planets	Sex	Drekkana	Drekkana Bala.
Ravi	Purusha	1st	15.00
Moon	Stree	1st	00.00
Kuja	Purusha	3rd	00.00
Budha	Napumsaka	3rd	00.00
Guru	Purusha	1st	15.00
Sukra	Stree	3rd	15.00
Sani	Napumsaka	2nd	15.00

Having found out the strength of each constituent, we can now determine the Sthana Bala.

In a rulerless land, people do not construct assembly halls nor do joyous men plant lovely gardens or build sacred houses such as temples and inns.

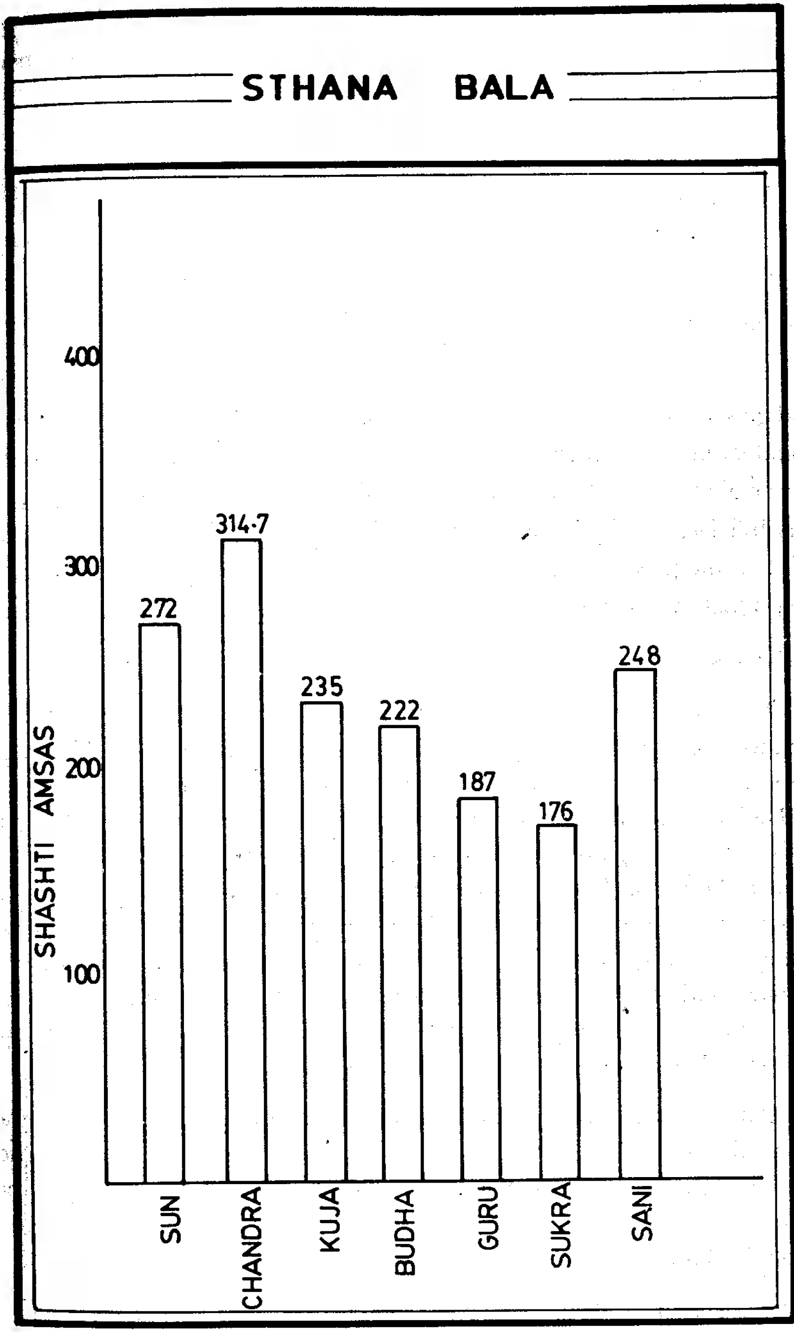
-Ayodhya Kanda - Canto 67 - Verse 12.

Determination of Sthana Bala in Sri Rama's horoscope:

Planets	Ravi	Moon	Kuja	Budha	Guru	Sukra	Sani
Ochcha Bala	60.000	41.000	60.0	12.00	58.000	60.000	60.00
Sapta vargaja bala	106.875	183.75	115.00	120.00	54.375	56.25	97.50
Ojayugma rasyamsa bala	30.00	30.00	0.00	30.00	0.00	30.00	15.00
Kendra bala	60.00	60.00	60.00	60.00	60.00	15.00	60.00
Drekkana bala	15.00	0.00	0.00	0.00	15.00	15.00	15.00
Total Sthana bala	271.875	314.75	235.00	222.00	187.375	176.25	247.50

In a rulerless land the twice-born given to the performances of sacrifices and self-controlled brahmans observing austere vows do not undertake sacrificial performances in which every one participating in it is both an officiating priest and a sacrificer.

-Ayodhya Kanda - Canto 67 - Verse 13.


STHANA BALA
SHASHTI AMSAS
400
300
200
100
272
314·7
235
222
187
176
248
SUN
CHANDRA
KUJA
BUDHA
GURU
SUKRA
SANI

Digbala:

This means the strength acquired by the planets on account of their occupancy of different directions or Diks in the horoscope.

Dik or Direction:

The ascendant represents the eastern direction, the 10th house denotes south; west is indicated by the descendant (7th house) and nadis (4th house) is the northern direction.

Planets and Dik:

Each planet in a particular Dik or Direction is supposed to be powerful and gets a certain quantity of strength. Jupiter and Mercury get full directional strength when they occupy the ascendant. The Sun and Mars are powerful in the south i.e., they get full Digbala in the tenth house. Saturn gets full Digbala by being in the 7th house, and the Moon and Venus will become powerful in the north, i.e, when they are in the fourth Bhava they will have complete Digbala.

Digbala Arc:

We have seen from the above that certain planets are powerful in certain directions, by occupying which they get full Digbala. This suggests that there are certain powerless points which when occupied give no Digbala. For instance, the Sun gets Digbala in the south (10th house). This is the most powerful point for the Sun. He gets Zero Digbala when he is in the north (fourth house), that is, the powerless point is the fourth house for the Sun. Similarly the 180th degree from the powerful point is the powerless point. The arc of the ecliptic between the longitude of a planet and its powerless point, we shall call as the Digbala arc. A Planet when approaching its powerful point gains Digbala and while reaching the powerless point it gradually loses Digbala.

Parasara says thus: subtract the longitude of the 4th house from the longitudes of the Sun and Mars. Subtract the 7th house from Guru and Budha. Subtract the 10th house from Sukra and the Moon. When the difference in the several cases exceeds 180°, subtract it from 360°. The

Determination of Digbala:

A planet at the direction where it is suposed to be most powerful gets a Digbala of 60 Shastiamsas. At the powerless point it will have zero strength (Digbala). At intermediate positions, proportionate reduction must be made. The Digbala Arc of a planet divided by 3, gives the Digbala or directional strength.

Determination of Digbala in Sri Rama's horoscope:

Graha	Longitude (deg)	Powerless point (deg)	Digbala Arc (deg)	Divide by 3 to get Shasti amsas
Ravi	9	183.2	174.2	58.06
Moon	90	363.2	273.2	91.06
Kuja	298	183.2	114.8	38.26
Budha	21	281.6	99.4	33.13
Guru	90	281.6	168.4	56.13
Sukra	357	3.2	6.2	2.06
Sani	200	101.6	98.4	32.8

Kala Bala or Temporal Strength:

This is the temporal strength or strength of time. The strength is calculated by considering the year, month, week-day, time etc., of birth. In other words, the various potencies of planetary vibrations due to seasonal peculiarities are scrutinized. It consists of (1) Nathanmatha Bala, (2) Paksha Bala, (3) Thribaga Bala, (4) Abda Bala or Varshadhipa Bala, (5) Masa Bala, (6) Vara Bala (7) Hora Bala (8) Ayana Bala and (9) Yudha Bala.

Nathanmatha Bala:

This is the strength that planets get on account of birth occurring during day or night. This is made up of Diva Bala (diurnal strength) and Ratri Bala (nocturnal strength). This is also known as Divaratri Bala.

The Moon, Sani and Kuja are powerful during midnight. And at midday they are thoroughly powerless. Ravi, Guru and Sukra are powerful during midday and they are utterly powerless at midnight. Budha on the other hand is always powerful be it day or night. Sani, Kuja and Chandra get 60 Shastiamsas at midnight as their Divaratri strength; at midday, Ravi, Sukra and Guru get a similar quantity and Budha always gets 60 Shastiamsas.

Midday and Midnight:

Midday at any place, is the local noon when the Sun Passes over its meridians. The Hindus consider the apparent noon (which is 12 o'clock midday) and consequently if birth time is marked in local mean time, it must be converted into the apparent time by applying equation of time. The midnight is marked when the Sun is in the lower meridian of the place and this is reckoned at 12 o'clock night.

Determination of Divaratri Bala in Sri Rama's horoscope:

Birth Time in Local Mean Time:	10.48 A.M.
Equation of Time:	− 2′
Birth Time in Local Apparent Time:	10.50 A.M.
10 hours at 15 seconds per hour:	150°
50 minutes at 2½ ′ per minute:	12.5
Total	162.5

$$\text{Diva Bala} = \frac{162^\circ.5}{3} = 54.16 \text{ (for Sun, Guru and Sukra)}$$

$$\text{Ratri Bala} = \frac{180 - 162.5}{3} = \frac{17.5}{3} = 5.83 \text{ (for Kuja, Moon \& Sani)}$$

Budha gets always 60 Sashtiamsas.

Thus Ravi	gets	54.16	Shastiamsas
Moon	"	5.83	"
Kuja	"	5.83	"
Budha	"	60.00	"
Guru	"	54.16	"
Sukra	"	54.16	"
Sani	"	5.83	"

Determination of Paksha Bala in Sri Rama's horoscope:

This is the strength of Paksha Bala or a fortnight. A Paksha is equal to 15 lunar days. The difference between the longitude of Sun and Moon is less than 180°. So the birth is in Sukla Paksha. Paksha Bala of benefics, Moon, Guru and Sukra is

$$\frac{\text{Moon's Longitude} - \text{Sun's Longitude}}{3} = \frac{90 - 9}{3} = 27$$

So the Paksha Bala of Moon, Guru and Sukra is 27 Shasti amsas. 60 minus 27 i.e., 33 Shasti amsas are the Paksha Bala of malefics Ravi, Kuja, Budha and Sani.

The Paksha Bala of Moon is always to be doubled. Thus the Paksha Bala of the planets is as follows:

Planet	Papa or Subha	Paksha Bala
Ravi	Papa	33
Moon	Subha	$27 \times 2 = 54$
Kuja	Papa	33
Budha	Papa	33
Guru	Subha	27
Sukra	Subha	27
Sani	Papa	33

Determination of Thribhaga Bala in Sri Rama's horoscope:

The birth of Sri Rama has taken place at day time (i.e., 32 Ghatikas, 12 Vighatikas is the duration of the day). It is divided into three equal parts. If the birth is in the first part, Budha in the second part, Ravi and Sani in the third part get 60 Shastiamsas. Now let us calculate the Thribhaga Bala.

Ahas (duration of the day)	32 Gh. 12 Vi.
Birth Time	13 Gh. 00 Vi.

Each thribaga consists of 10.76 Gh.

So the birth of Sri Rama has taken place in the 2nd part.

The second part in a day is ruled by Ravi.

So Ravi gets 60 Sashtiamsas.

Guru always gets 60 Sashtiamsas.

Planet	Thribaga Bala
Ravi	60 Sashti amsas
Guru	60 " "

Shristyadhi Ahargana:

To determine the Abdhabala, Masa bala, Vara bala etc., we require the Shristyadi Ahargana i.e., the number of days (terrestrial) passed from the day of creation. Sri B.V.Raman in his book 'Graha and Bhava Balas', in page 42 has calculated and given the Ahargana for the date 2nd May, 1827 as 714,406,097,641 days. When the difference between the Julian day of this day and the Julian Day on the day of the birth of Sri Rama, is subtracted we get the required Ahargana days.

Now let us calculate the Julian Day for the 2nd May, 1827 A.D.
4713 B.C. is 4712 years.
Adding this to 1827, we get 6539 years.

6539×365	=	2386735	days.
Integral part of $\dfrac{(4712 + 1827) + 3}{4}$	=	1635	"
No. of days from 2.5.1827 to 1st Jan	=	121	"
Total		2388491	"
Less		12	"
Julian Day on the 2nd May, 1827 A.D.	=	2388479	
Subtracting the Julian Day		102311	
Difference.		2286168	

The Abdhadhipathi:

This is the lord who presides over the year - the year in which Sri Rama is born. This lord is the lord of the week days on which the year began. When 360 the duration of the year is divided by 7, we get a remainder of 3 and the quotient is 51. This quotient represents the number of weeks. The remainder 3 denotes that the first day of any particular year will be three days later than that of the previous one. Therefore, in order to determine the abdhadhipathi the number of days passed from creation to birth must be divided by 360, the quotient taken as representing the number of complete years passed from creation and the remainder rejected. The quotient

must be multiplied by 3 and to the product 1 added, and the resulting sum divided by 7. The quotient is then cast off and the remainder counted from Sunday. This will give the week day of the commencement of the year and its lord will be Abdhadhipathi.

Finding out the Abdhadhipathi in Sri Rama's horoscope:

Ahargana days from Shristiyadhi till 2nd May, 1827 A.D.		– 714,406,097,641
Julian Day on 2nd May, 1827 A.D.,	2388479	
" " on 11.2.4433 B.C.	102311	
Subtracting	2286168	2,286.168
Ahargana days till Sri Rama's birth		714,403,811,473

Number of days elapsed since the creation of the world up to the day of Birth of Sri Rama	714,403,811,473 days.
Dividing by 360, the quotient is	19,844,550,031 days.
Multiplying by 3, we get	59,533,650,093 days.
Adding 1 we get	59.533.650,094 days.

Dividing by 7 we get the remainder as 2.
Counting from Sunday, we get Monday as the week day.
Moon is the lord of Monday and hence is the king of the year of birth.
So Moon gets 15 Shastiamsas.

Masadhipathi:

The planet that rules the week day of the commencement of the month of birth will be the Masadhipathi or lord of the month. In order to get the Masadhipathi, the number of days elapsed since the creation must be divided by 30, the quotient taken for the number of complete months passed from the creation to the day of Sri Rama's birth. The remainder is rejected. The quotient is then multiplied by 2 and 1 added to the product. The resulting sum is divided by 7, the quotient rejected and the remainder is taken into account. Counting this from Sunday, will give the commencement of the month and its lord will be the Masadhipathi.

Finding out the Masadhipathi in Sri Rama's horoscope:

Number of days elapsed since the creation of the world up to the day of Sri Rama's birth	714 403 811 473
Dividing by 30, we get	23 813 460 382
Multiplying by 2, we get	47 626 920 764
Adding 1, we get	47 626 920 765

Dividing by 7, we get the remainder as 4.
Counting this from Sunday, we get Wednesday.

So Wednesday is the Week day of the commencement of the month. Budha is the lord of Wednesday and is the Masadhipathi. Thus Budha gets 30 Shastiamsas as Masadhipathi.

Varadhipathi:

We know that Sri Rama was born on a Sunday. Sun is the lord of Sunday. So Sun is the Varadhipathi and gets 45 Shastiamsas.

Determination of Hora Bala in Sri Rama's horoscope:

A day is divided into 24 hours or horas and each hora is ruled by a planet. The planet that rules the hour or the birth gets a value of 60 Shastiamsas. The Hindu day begins with sunrise and continues till next sunrise. The first hora on any day will be the first hour after sunrise. Everyday, the first hora is ruled by the lord of the week day and the lord succeeds according to an order.

Sri Rama's birth has taken place on a Sunday. So the first hora is ruled by Ravi himself. The 2nd is ruled by Sukra, the 3rd by Budha, the 4th by Moon, the 5th by Sani, the 6th by Guru, etc. Now let us calculate the hora bala of Sri Rama:

If the birth time is marked in English hours,

L.M.T. of birth - L.M.T. of sunrise = number of horas from sunrise.

Birth time of Sri Rama in L.M.T.	10.48 hours
L.M.T. of sunrise	5.36 hours
Difference	5.12 hours

So it is the 6th hora and the lord is Guru.
Thus Guru gets 60.00 Shastiamsas as Horadhipathi Bala.

Ayana Bala:

Each planet will be situated either towards the North or South of the celestial equator and as a result of this circumstance, it gains a certain amount of strength. This strength or potency is known as Ayana Bala.

Kranty:

A heavenly body moves northwards the equator for some time and then southwards. This angular distance from the equinoctial or celestial equator is its kranty or the declination. Declinations are reckoned plus or minus according as the planet is situated in the northern or southern celestial hemisphere.

For instance, the Sun cuts the celestial equator twice every year, i.e., once in March and once in September. The declination is always measured in respect of sayana Granha that is a planet reckoned from the movable zodiac point.

The Sun, after cutting the celestial equator in March (when the Aries ingress or Sayana Mesha saṅkramana takes place) moves northwards and his declination which is plus or positive gradually increases till it is 24° (23° 27′) when the Sun will have reached the last point of Gemini or 90° from the beginning of the moving zodiac. 24 deg., Kranty means that the Sun has reached the northern most point of the North celestial hemisphere. Then the Kranti falls down gradually along with his Cancer ingress till it is 0°, when the Sun will have again crossed the equator to begin his southerly course (i.e., the Libra ingress takes place). Now he will have dakshina Kranty or south declination. He moves southwards. His declination which is now negative or minus gradually increases till its 24° (23° 27′) when the Sun will have reached the last point of Dhanus or 270° from the beginning of the moving zodiac. His Capricorn ingress begins. The Kranty decreases gradually till it is again zero when he will have crossed the equator (or entered Sayana Mesha) to begin his northerly course.

Determination of Kranty:

From the above, it will be evident that the distance of planet from its nearest equinoctial point determines its Kranty or declination. The maximum declination (according to the Hindus) is 24° while modern astronomical savants have it as 23° 27′ or so. As the difference between the two values is negligible, for astrological purposes, we may consider 24° as the maximum Kranty of a Sayana planet and adopt it for our calculations.

Modern ephemeris give declinations of planets for Greenwich Noon every day, but since the process involved in their calculation is so simple, we will do well to ascertain the Kranties by applying the rules set forth below.

First convert the Nirayana longitudes of planets at birth into their respective sayana longitudes. Find out their Bhujas. This will give their distance from either the first point of mesha or the first point of Thula. At the end of the first 15° (from one of the two points referred to above) the declination of a planet is 362 minus of arc; at the end of the second 15°, it is greater by 341, i.e., when the planet has advanced 30° (from any one of the two points stated above) its declination is 362 + 341 i.e., 703 minutes of arc or 11° 43′; at the end of the third 15° it is further increased by 299′; at the end of the fourth 15° it is still greater by 236′; at the end of the fifth 15° it is raised by 150′ more; and at the end of the sixth it is further increased by 52′.

We can summarize the above observations thus. The maximum declination of 24° is reached when the planet has advanced 90° from any one of the equinoctial points. Six equal divisions of 15° each are made of this 90° and the declination measured as described already.

Dakshina or Uttara Kranty:

A planet had Dakshina Kranty or south declination when its sayana longitude is between 180° to 360°. It has Uttara Kranty or north declination when the sayana longitude is between 0° to 180°.

Calculations for Ayana Bala in Sri Rama's horoscope:

Planet	Sayana Longitude	Bhuja	No. of Degrees	Division
	o	o		
Ravi	9.0	9.0	9.0	0
Moon	90.001	89.999	14.999	5
Kuja	278.179	81.821	6.821	5
Budha	2.157	2.157	2.157	0
Guru	70.058	70.058	10.058	4
Sukra	337.479	22.521	7.521	1
Sani	180.076	0.076	0.076	0

Kranties of Planets:

Ravi	362	+	$9/15 \times 362$	= 9.65 (N)
Moon	1388	+	$14/15 \times 52$	= 23.99 (N)
Kuja	1388	+	$6.821/15 \times 52$	= 23.53 (S)
Budha	–		$2.157/15 \times 362$	= 0.87 (N)
Guru	1238	+	$10.058/15 \times 150$	= 22.3 (N)
Sukra	362	+	$7.521/15 \times 341$	= 8.8 (S)
Sani	–		$0.076/15 \times 362$	= 0.03 (S)

Determination of Ayana Bala:

The Ayana bala of a planet at the equator is 30 Shastiamsas. This is increased when the planet's declination increases and is additive. The planet's Ayanabala gets reduced proportionately when the Kranty is subtractive.

The Ayana bala is obtained by the following formula which is according to Kesava Daivanya.

$$\frac{24^\circ \pm \text{Kranty}}{48} \times 60 = \text{Ayana bala}$$

In case of Sukra, Ravi, Kuja and Guru their north declinations are additive and south declinations are subtractive. In case of Sani and Moon, their south declinations are additive while their north declinations are subtractive. For Budha the declination, north or south, is always additive. And double the Ayanabala in the case of the Sun.

Planets	South or North declination	Additive or subtractive
Ravi, Kuja, Guru and Sukra	North	Additive
-do-	South	Subtractive
Moon, Sani	South	Additive
-do-	North	Subtractive
Budha	North or South	Additive

(Double Ayanabala for Sun)

Ayanabala in Sri Rama's horoscope:

$$\text{Ravi } \frac{24 + 9.65}{48} \times 60 = 42.06$$

$$\text{Moon } \frac{24 - 23.99}{48} \times 60 = 0.01$$

$$\text{Kuja } \frac{24 - 23.53}{48} \times 60 = 0.58$$

$$\text{Budha } \frac{24 + 0.87}{48} \times 60 = 30.11$$

$$\text{Guru } \frac{24 + 22.3}{48} \times 60 = 57.87$$

$$\text{Sukra } \frac{24 - 8.88}{48} \times 60 = 18.9$$

$$\text{Sani } \frac{24 + 0.03}{48} \times 60 = 30.04$$

Yudha Bala in Sri Rama's horoscope:

Two planets are said to be in Yudha or fight when they are in conjunction and the distance between them is less than a degree. All the planets excepting Ravi and Moon may enter into the war. The conquering planet is the one whose longitude is less.

In Sri Rama's horoscope Moon and Guru are in the same longitude. But Moon does not enter into war. So there is no Yudha bala involved. No other planets are in the same longitude. Thus there is no Yudha Bala in Sri Rama's horoscope.

Total Kala Bala:

To get the total Kala Bala in Sri Rama's horoscope if we add the various items of Kala Bala, arrived at above so far, we get the total kala bala as done below.

	Ravi	Moon	Kuja	Budha	Guru	Sukra	Sani
Nathonnatha bala	54.16	5.83	5.83	60.00	54.16	54.16	5.83
Paksha Bala	33.00	54.00	33.00	33.00	27.00	27.00	33.00
Thribhaga Bala	60.00	–	–	–	60.00	–	–
Abda bala	–	15.00	–	–	–	–	–
Masa bala	–	–	–	30.00	–	–	–
Vara bala	45.00	–	–	–	–	–	–
Hora bala	–	–	–	–	60.00	–	–
Ayana bala	42.06	0.01	0.58	30.11	57.87	18.9	30.04
Yudha Bala	–	–	–	–	–	–	–
Total Kala Bala	234.22	74.84	39.41	153.11	259.03	100.06	68.87

Chesta Bala or Motional Strength:

Chesta Bala means Vakra Chesta or act of retrogression. Each planet, except the Sun and the Moon and the shadowy planets, gets into the state of vakra or retrogression when its distance from the Sun exceeds a particular limit. And the strength or potency due to the planet on account of the Arc of retrogression is termed as Chesta Bala.

The facts relating to the phenomenon described in Hindu Astronomical works are of a complicated nature. To enter into discussion of the underlying principles of this phenomenon and to expound them intelligently in this book would amount to enormous work. In

view of this, it is thought fit to give in the subsequent pages a simple method for measuring the Chestrakendra necessary for calculating Chesta Bala.

Superior and Inferior planets, conjunctions and oppositions:

The planets Kuja, Guru and Sani are superior planets. The planets Budha and Sukra are inferior planets.

The superior planet when it occupies the same longitude as the Sun is said to be in conjunction with him. It is said to be in opposition when its distance from the sun is exactly 180°

Madhya Grahas:

The Madhya of a graha is its mean longitude in its path round the Sun. The mean position of a planet is the position which it would have attained at a uniform rate of motion and the correction to be applied in respect of the eccentricity of the orbit is not considered. The mean longitude is reckoned on the assumption that the orbits of planets are concentric circles. Because the orbits are elliptical and not circular, equations are later on applied to the mean positions to get the true longitudes. In Chapter V we have already calculated the mean longitudes of the planets.

Seegrochcha:

The seegrochcha is the apogee of the planet. It is required to find out the Chesta Kendra.

Seegrochcha of Superior Planets:

The Mean longitude of the Sun will be the Seegrochcha of Kuja, Guru and Sani. So the Seegrochcha of Kuja, Guru and Sani is 9°

Sreegrochcha of Budha.

Julian Day on 1st January 1900 A.D	2415021
Julian Day on 11th February 4433 B.C.	102311
Difference i.e., interval	2312710
Movement of Budha at 4°.09 per day	343°.8
Correction 6.67 + [(1900 + 4433) × 0.001333]	15°.1
Sreegrochcha of Budha on 1900 A.D	164°.0
Totalling for required sreegrochcha of Budha	163°.0

Sreegrochcha of Sukra:

Interval as arrived at above	2312710 days.
Movement of Sukra for the above days at 1.6° per day	256°.0
Sreegrochcha on 1900 A.D.	328°.81
Correction 5 + (6333 × 0.001)	11°.33
Total	596°.14
Expunging 360°	236°.14

So the sreegrochcha of Sukra is 236°.14

Chesta Kendras of Planets:

The Chesta Kendra is also called Sreegrochcha Kendra. According to Sripathi it is obtained by applying the formula:-

$$\text{Planet's Sreegrochcha} = \frac{(\text{its Mean Long.} + \text{its true long.})}{2}$$

$$= \text{Chesta Kendra}$$

Planet	Its Seegrochcha		$\frac{\text{Its Mean Long} + \text{Its true Long.}}{2}$	Kendras
Kuja	9°.0	—	$\frac{234°.83 + 298}{2}$	102.585
Budha	163°.0	—	$\frac{200°.03 + 21}{2}$	52.485
Guru	9°.0	—	$\frac{79°.99 + 90}{2}$	284.005
Sukra	236°.0	—	$\frac{292°.17 + 357}{2}$	271.415
Sani	9°.0	—	$\frac{180°.95 + 200}{2}$	178.25

Reduced Chesta Kendra:

Planet	Chesta Kendra	360° - Chesta Kendra (If Chesta Kendra is greater than 180°)	Reduced Chesta Kendra
Kuja	102.585	–	102.585
Budha	52.485	–	52.485
Guru	284.005	360°.0 – 284.585	75.995
Sukra	271.415	360°.0 – 271.415	88.585
Sani	178.525	--	59.508

Chesta Bala:

The Chesta Bala is zero when the Chesta Kendra is also zero. When it is 180°.0 the Chesta Bala is 60 Shastiamsas. In intermediate position, the bala is found by proportion with the aid of the formula, Reduced Chesta Kendra ÷ 3 = Chesta Bala.

Chesta Bala in Sri Ram's horoscope:

Kuja	102.585/3	34.195	Shastiamsas
Budha	52.485/3	17.485	"
Guru	75.995/3	25.332	"
Sukra	88.585/3	29.528	"
Sani	178.525/3	59.508	"

Naisargika Bala or Natural Strength:

This is the natural strength that each planet possesses. The value assigned to each depends upon its luminosity. Ravi, the brightest of all the planets has the greatest naisargika strength while Sani, the darkest has the last naisargika Bala. This strength is fixed and holds good in all nativities. Varahamihira observes thus: **"Sakubugusucharagni Vruddhitho Veeryavanthaha"** meaning that from Saturn to the Sun (according to the order Saturn, Mars, Mercury, Jupiter, Venus, Moon and Sun) the Naisargika bala gradually increases.

So the Naisargika bala in Sri Rama's horoscope is:

Ravi	60	Shastiamsas
Moon	51.43	"
Kuja	17.14	"
Budha	25.70	"
Guru	34.28	"
Sukra	42.85	"
Sani	8.57	"

Drik (Dristi) Bala or Aspect Strength:

Dristi means aspect.All planets powerfully aspect the 180th degree from their positions.

Dristi Kendra:

This is the aspect angle. A planet cannot aspect another planet or Bhava within 30° in front of it and 60° behind it. That is, the aspect proper commences from 30° in front of the planet and it stops short at the 300th degree from the planet. A planet cannot exercise any aspect over another Bhava or planet which is within 30° or beyond 300° from the aspecting planet. Dristi Kendra (Aspect Angle) commences from 30°, gradually increases and at 60° it gets an aspect value of 15 Shastiamsas. The value increases till the Dristi Kendra is 90°. When it is 90°, the Dristi value will be 45 Shastiamsas. Again from 120° to 150° the value falls down and the Dristi value will be nil at 150°. From 150° onwards till 180° there is a sudden jump in the Dristi value and the maximum Dristi of 60 Shastiamsas is attained at 180°. Again the value diminishes gradually till it reaches zero at 300°.

Dristi Graha:

A planet that aspects or in other words, the aspecting body is called the Dristi Graha.

Drusya Graha:

The planet that is aspected is known as Drusya Graha.

Method of finding Dristi Kendras or Aspect Angle:

Subtract the longitude of the Drishta Graha (aspecting planet) from that of the Drusya Graha (aspected body). The result represents Dristi Kendra or Aspect Angle.

Rule: Dristi Kendra = Longitude of Drusya Graha - Longitude of Driśhta Graha.

Determination of Dristi Kendra in Sri Rama's Horoscope:

	Ravi	Moon	Kuja	Budha	Guru	Sukra	Sani
Ravi	–	279	71	–	279	–	169
Moon	81	–	152	69	–	93	250
Kuja	289	208	–	277	208	–	98
Budha	–	291	83	–	291	–	181
Guru	81	–	152	69	–	93	250
Sukra	–	267	59	–	267	–	157
Sani	191	110	262	179	110	203	–

Dristi Value:

Sripathi says, "Subtract the Dristi from Drushya and if the remainder exceeds 6 signs and is within 10 signs subtract this remainder from 10 signs, convert the remainder into minutes, divide the result by 7200, so that the Dristi value may be obtained."

From the above, we can formulate the following rule and obtain the Dristi values.

> ***Overjoyed to eat ears of fully ripe paddy and holding them in their beaks, a charming row of cranes takes its flight across the sky with a dashing speed like a knotted garland carried by the wind.***
>
> ***- Kishkinda Kanda - Canto 30 - Verse 47***

Dristi value

If the Dristi angle is between	Dristi value is equal to
6 & 10 signs or 180° & 300°	$\frac{300 - \text{Dristi Kendra}}{2}$
5 & 6 signs or 150° & 180°	Dristi Kendra − 150 × 2
4 & 5 signs or 120° & 150°	150° − Dristi Kendra
3 & 4 signs or 90° & 120°	$\frac{120^\circ - \text{Dristi Kendra}}{2}$ 30
2 & 3 signs or 60° & 90°	Dristi. Kendra − 60° − 15
1 & 2 signs or 30° & 60°	$\frac{\text{Dristi Kendra} - 30^\circ}{2}$

Visesha Dristi:

Some planets have what is called visesha dristi or special aspect in addition to their usual dristi. Sani has dristi in the 3rd (60° − 90°) and 10th (270° − 300°) houses. Guru has visesha dristi in the 5th (120 − 150°) and 9th (240° − 270°) and Kuja has special aspect in the 4th (90° − 120°) and the 8th (210° − 240°) The Visesha dristi value of Kuja is 15 Shastiamsas; that of Guru is 30; and that of Sani is 45 Shastiamsas.

After finding out the ordinary dristi values of all the grahas, the special dristi values must be added to the ordinary ones in the case of Kuja, Guru and Sani, if they have really any special aspect in the horoscope over any other planets.

Subha and Papa dristies:

The aspect cast by a benefic planet is Subha dristi (Positive aspect) and may be denoted by a positive sign or with no sign. The aspect cast by a malefic planet is known as Papa dristi (negative aspect) and may be denoted by a negative sign.

Papa Grahas:

Papa grahas are malefic planets. They are Ravi, Kuja, Krishna Chandra, Sani and badly associated Budha.

Subha grahas:

Subha grahas are the benefic planets. They are Guru, Sukra, Chandra (waxing Moon) and well associated Budha.

Dristi Pinda:

The Sum total of the Dristi values of all Drista grahas (aspecting planets) over the Drusya grahas (aspected planets) is called the Dristi Pinda. This is negative or positive according to the dristi of the Papas (malefics) or the Subhas (benefics) being greater.

Determination of Dristi Pindas in Sri Rama's horoscope:

	Ravi	Moon	Kuja	Budha	Guru	Sukra	Sani	Total
Ravi	–	10.50	36.00	–	10.50	–	–38	–43
Moon	–36	–	–4	–24.0	–	–25.0	–25.0	–45.5
Kuja	–5.5	46.0	–	–11.5	46.0	–	–41.0	34.0
Budha	–	4.5	–38.0	–	4.5	–	–59.5	–87.0
Guru	–36.0	–	–4.0	–24.0	–	43.5	–	–46.0
Sukra		16.50	–14.5		46.5			48.5
Sani	–54.50	35.0	–19.0	–58.0	35.00	48.5	–48.5	–61.5

Determination of Drik Bala in Sri Rama's horoscope:

This means aspect strength. The Drik Bala of a planet is one fourth of the Dhrishti Pinda on it. It is positive or negative according as the Dhrishti Pinda is positive or negative.

Planet	Dhrishti Pinda	Drik Bala
Ravi	–43.0	–10.75
Moon	–45.5	–11.75
Kuja	34.0	8.50
Budha	–87.0	–21.75
Guru	–46.0	–11.50
Sukra	48.50	12.125
Sani	–61.5	–15.375

The Shad Bala Pindas:

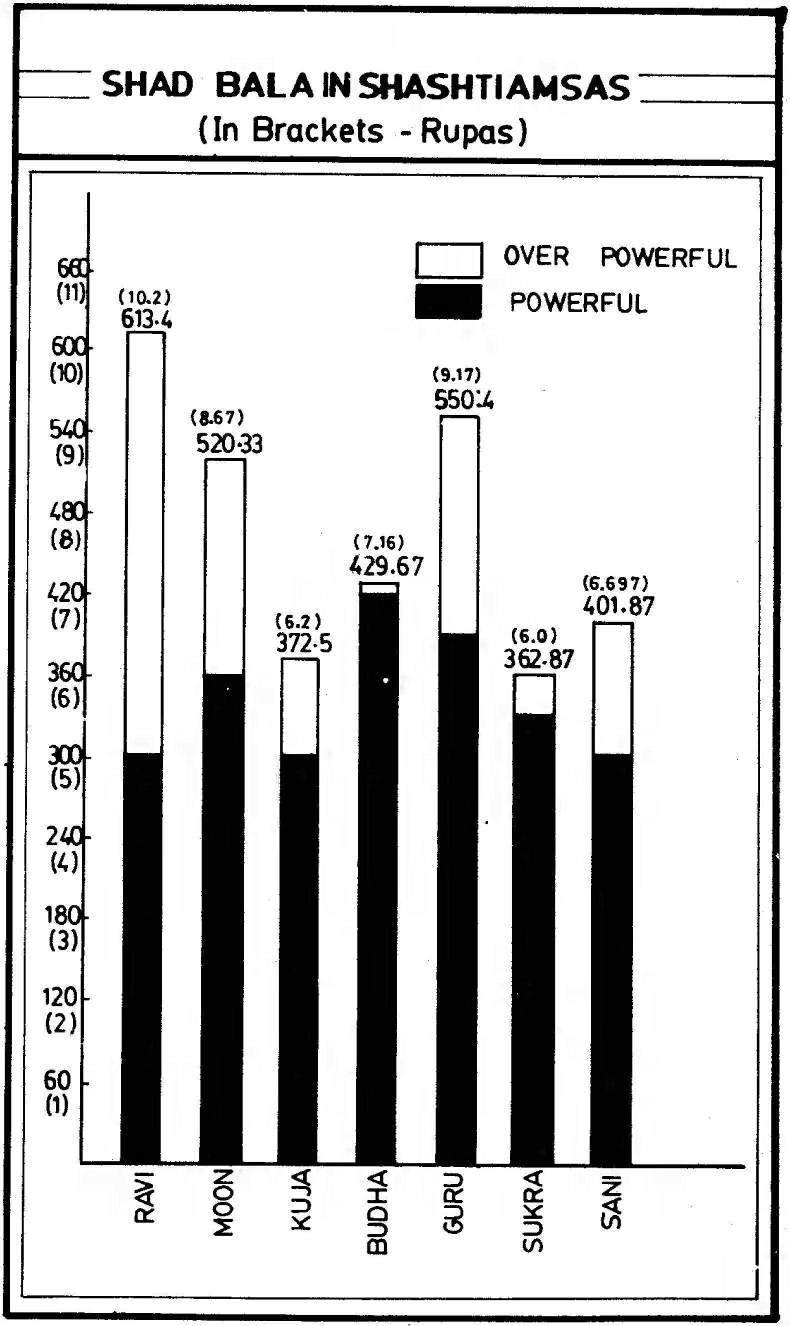
We have determined the various kinds of balas of the planets. When all these balas viz., Sthana, Dik, Kala, Chesta and Naisargika, are added we get the total strength of the Shad Bala Pinda. The graha's Drik Bala must be added to or subtracted from the above according as it is positive or negative.

Shad Bala in Sri Rama's horoscope:

	Ravi	Moon	Kuja	Budha	Guru	Sukra	Sani
Sthana	271.875	304.75	235.00	222.00	187.375	176.25	247.5
Dig	58.06	91.06	38.26	33.13	56.13	2.06	32.9
Kala	234.22	74.84	39.41	153.11	259.03	100.06	68.87
Chesta	–	–	34.195	17.485	25.332	29.528	59.508
Naisargika	60.0	51.43	17.14	25.7	34.28	42.85	8.57
Drik	−10.75	−1.75	8.5	−21.75	−11.75	12.125	-15.375
Total Shastimsas	613.405	520.33	372.505	429.675	550.397	362.873	401.873
In Rupas	10.22	8.67	6.208	7.161	9.173	6.048	6.698

Control of the senses and the mind, forgiveness, righteousness, fortitude, truthfulness, valour and punishing the evil doers are the virtues of kings.

Kishkinda Kanda - Canto 17 - Verse 19


SHAD BALA IN SHASHTIAMSAS
(In Brackets - Rupas)
OVER POWERFUL
POWERFUL
660 (11)
600 (10)
540 (9)
480 (8)
420 (7)
360 (6)
300 (5)
240 (4)
180 (3)
120 (2)
60 (1)
(10.2) 613.4
(8.67) 520.33
(6.2) 372.5
(7.16) 429.67
(9.17) 550.4
(6.0) 362.87
(6.697) 401.87
RAVI
MOON
KUJA
BUDHA
GURU
SUKRA
SANI

Powerful Planets:

Ravi is held to be powerful when his Shad Bala is 5 or more Rupas. Chandra becomes strong when his Shad Bala Pinda is 6 or more. Kuja becomes powerful when his Shad Bala Pinda is 5 or more. Budha becomes potent by having Shad Bala Pinda as 7 Rupas. Guru, Sukra and Sani become thoroughly powerful if their Shad Bala Pindas are 6.5, 5.5 and 5 Rupas or more respectively.

Powerful Planets in Sri Rama's horoscope:

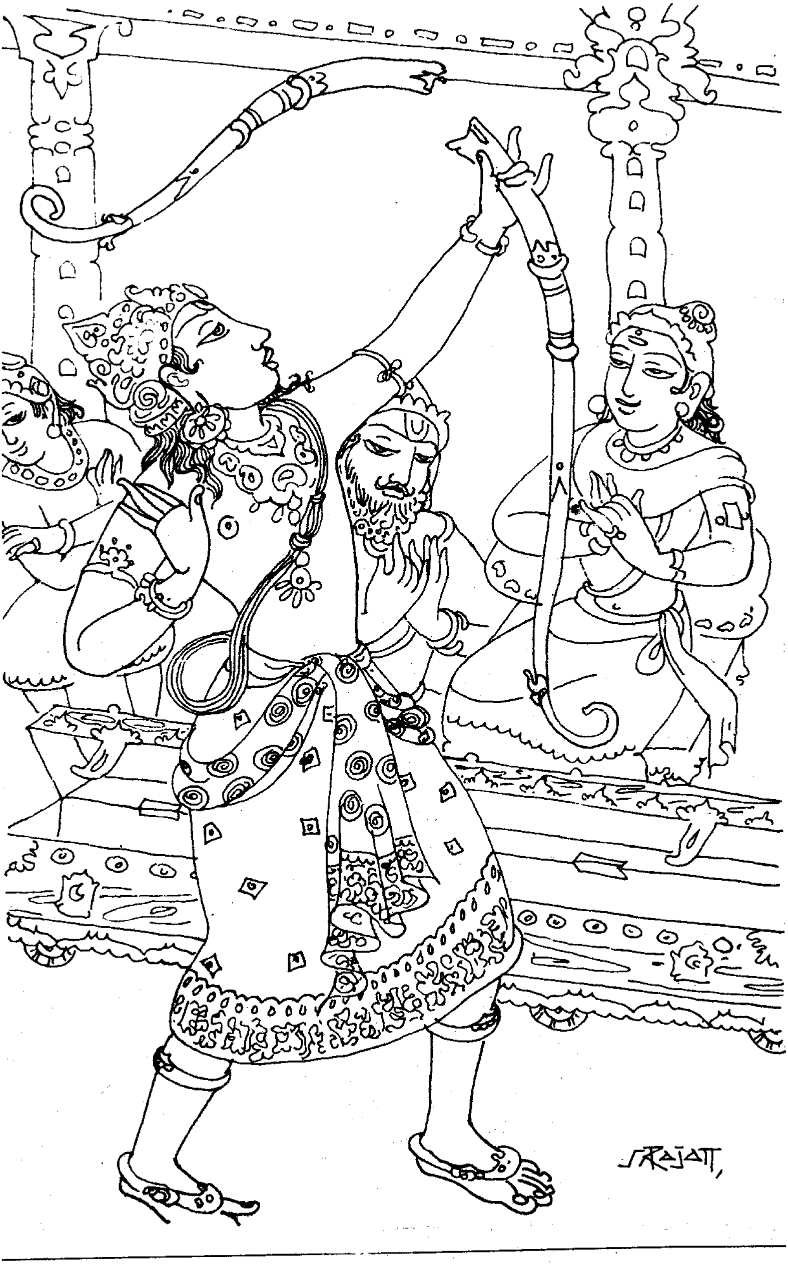
Planet	Shad Bala Pinda in Rupas	Powerful Rupa	No. of times Powerful or Powerless
Ravi	10.22	5	2.04
Moon	8.67	6	1.445
Kuja	6.208	5	1.2416
Budha	7.164	7	1.023
Guru	9.173	6.5	1.411
Sukra	6.048	5.5	1.099
Sani	6.698	5	1.339

In Sri Rama's horoscope all the planets are powerful more than 100%. This signifies the divinity. Ravi is most powerful with more than twice in its powerful Rupas. The order of the strength of the planets is classified below.

Planet	Most powerful order
Ravi	I
Moon	II
Guru	III
Sani	IV
Kuja	V
Sukra	VI
Budha	VII

Bhava Bala or House Strength:

Bhava Bala is the potency or strength of the house or Bhava or signification. Each of the 12 bhavas comprehend all human events;


SRAJAN,

or functions. For instance, the first bhava represents Thanu or body, the appearance of the individual, his complexion, his disposition, his stature, etc. If it attains certain strength, the native will enjoy the indications of the bhava fully otherwise he will not enjoy them sufficiently.

The strength of a bhava is composed of three factors, viz., (1) Bhavadhipathi Bala, (2) Bhava Dig Bala and (3) Bhava Dhristi Bala.

Bhavadhipathi Bala:

This is the potency of the lord of the bhava. The lord of a bhava is the planet in whose sign the bhava madhya falls. The Shad Bala Pinda (aggregate of the Shad Balas) of the lord of the bhava constitutes its Bhavadhipathi Bala.

Bhavadhipathi Bala in Sri Rama's horoscope:

Bhava	Bhava Madya	Sign	Lord	Bhavadhipathi Bala in Rupas
I Thanus	101.6	Kataka	Moon	8.67
II Dhana	125.2	Simha	Ravi	10.22
III Bhrathu	151.7	Kanya	Budha	7.164
IV Matru	183.2	Tula	Sukra	6.048
V Putra	218.2	Vrischika	Kuja	6.208
VI Satru	253.1	Dhanus	Guru	9.173
VII Kalatra	281.6	Makara	Sani	6.698
VIII Ayur	305.2	Kumba	Sani	6.698
IX Bagya	331.7	Meena	Guru	9.173
X Karma	3.2	Mesha	Kuja	6.208
XI Labha	38.2	Vrishaba	Sukra	6.048
XII Vraya	73.1	Mithuna	Budha	7.164

Bhava Dig Bala:

This is the strength acquired by the different bhavas falling in the different groups of types of signs. The Zodiacal signs are grouped into Nara Rasis (human signs), Jalachara Rasis (aquatic signs), Chathushpada (quadrupedal signs) and Keeta Rasis (insect signs). It is supposed that a particular bhava acquires strength by its mid-point falling in a particular kind of sign. For instance if the mid-point of the fourth house happens to fall in a Jalachara Rasi it gains a strength of a Rupa.

Nara Rasis:

Nara Rasis mean human signs. They are Mithuna, Kanya, Tula, first half of Dhanus and Kumbha. If the midpoint of the ascendant happens to fall in any one of these signs, then the ascendant acquires a strength of one Rupa. And conversely, if the midpoint of the seventh house falls in a Nara Rasi, the seventh bhava loses all vitality.

Jalachara Rasis:

Watery or aquatic signs are termed as Jalachara Rasis. They are Kataka, second half of Makara and Meena. If the fourth house falls in a Jalachara Rasi, it gets a strength of 60 Shastiamsas. When a sign belonging to this type becomes the Bhava Madhya of the 10th house, it becomes exceedingly powerless.

Chathushpada Rasis:

These are the quadrupedal signs, viz., Mesha, Vrishabha, Simha, second half of Dhanus and first half of Makara. When a Chathush pada Rasi becomes the Bhava Madhya of the 10th house, the bhava becomes most powerful and gets 60 Shastiamsas. Conversely, the mid-point of the fourth house in a like sign becomes utterly weak.

Keeta Rasis:

These are insect signs. In the whole of the Zodiac, Vrischika is the only Keeta Rasi. Scorpio by its nature is highly mischievous. If a Keeta Rasi happens to be Bhava Madhya of the seventh house, it acquires a potency of 60 Shastiamsas. Likewise, if the Bhava Madhya of the ascendant happens to fall in a Keeta Rasi, it becomes powerless.

Determination of Bhava Dig Bala:

The lagna bhava becomes most powerful when it falls in a Nara Rasi, getting a strength of 60 shastiamsas. When a Nara Rasi happens to be Bhava Madhya of the seventh bhava, it becomes powerless and gets zero shastiamsas. The strength decreases gradually from the first Bhava Madhya till it is nil at the seventh Bhava Madhya. Similarly the Bhava Madhya of a Chatushpada Rasi becomes utterly powerless when it happens to be the fourth and reaches its maximum power when it becomes the Bhava Madhya of the tenth. The value of the strength increases from the fourth Bhava Madhya at 10 shastiamsas per sign till it is 60 at the tenth Bhava Madhya. Therefore, first find the number of a given Bhava Madhya and subtract it from 1, if the given Bhava Madhya is situated in the last half of Makara, Kataka, Meena or Vrischika. Subtract it from 4, if the given Bhava Madhya is situated in Mesha, Vrishaba, Simha, first half of Makara or last half of Dhanus. Subtract it from 7 if in Mithuna, Tula, Kumbha, Kanya or first half of Dhanus. Lastly from 10 if in Cancer, Meena and last half of Makara. If the difference exceeds 6, subtract it from 12, otherwise take it as it is and multiply this difference by 10. You will then get Bhava Dig Bala of the particular bhava.

Determination of Bhava Dig Bala in Sri Rama's horoscope:

Bhava	Bhava Dig Bala
1 st.	0
2nd	20
3rd	40
4th	30
5th	50
6th	10
7th	30
8th	10
9th	10
10th	60
11th	50
12th	50

Bhava Drishti Bala and finding-out Bhava Drig Bala:

Subtract the longitude of the aspecting planet from the aspected Bhava Madhya, adding 360 to this when it is less than the longitude of aspecting planet. The Drishti Kendra is obtained. Get the Dhrishti value by applying to the Drishti Kendra, the principles described in the calculation of DrishtiBala. Add Visesha Dhrishti, if any, of Kuja, Guru and Sani. Then adopt the Dhrishti values of Guru and Budha on the Bhava Madhya as they are; adopt a fourth of the aspect value of other planets, over the Madhya Bhava. The dhrishti on the Bhava Madhya will be positive or negative according to the Subha Drishti on it being greater or less than Krura Drishti. The drishti is subha (positive) when the aspecting planet is a natural benefic and it is papa when the aspecting. planet is natural malefic.

Determination of Aspect Angle in Sri Rama's horoscope:

Bhava & its long. o	Ravi 9°.0 o	Moon 90°.0 o	Kuja 298°.0 o	Budha 21°.0 o	Guru 90°.0 o	Sukra 357°.0 o	Sani 200°.0 o
1st 101.6	92.6	–	163.6	–	–	104.6	261.6
2nd 125.2	116.2	–	187.2	104.2	–	128.2	285.2
3rd 151.7	142.7	–	213.7	130.7	–	154.7	311.7
4th 183.2	174.2	93.2	245.2	162.2	93.2	186.2	–
5th 218.2	219.2	128.2	280.2	197.2	128.2	221.2	–
6th 253.1	244.1	163.1	315.1	232.1	163.1	256.1	–
7th 281.6	272.6	191.6	–	260.6	191.6	284.6	81.6
8th 305.2	296.2	215.2	–	284.2	215.2	308.2	105.2
9th 331.7	322.7	241.7	–	310.7	241.7	–	131.7
10th 3.2	–	273.2	65.2	–	273.2	–	163.2
11th 38.2	–	308.2	100.2	–	308.2	–	198.2
12th 73.1	64.1	–	135.1	–	–	76.1	233.1

Note: Figures underlined indicate visesha drishti.

Determination of Dhrishti Bala of Bhavas (in sashti amsas) ie. Dhrishti Grahas in Sri Rama's horoscope.

Bhava	Ravi ¼ −	Moon ¼ +	Kuja ¼ −	Budha 1 −	Guru 1 +	Sukra ¼ +	Sani ¼ −	Bhava Drig Bhala
1st	10.92	–	6.6	–	–	9.42	4.8	-12.9
2nd	11.725	–	14.1	37.9	–	5.45	1.85	-60.12
3rd	1.82	–	10.79	19.3	–	2.35	–	-29.56
4th	12.1	10.85	6.85	24.4	43.4	14.22	–	25.12
5th	11.35	5.45	2.47	51.4	21.8	9.85	–	-28.12
6th	6.99	6.55	–	33.95	26.2	5.49	–	-2.7
7th	3.42	13.55	–	19.7	54.2	1.92	–	46.55
8th	0.48	10.6	–	7.9	42.4	–	9.15	35.48
9th	–	7.29	–	–	29.15		4.58	31.86
10th	–	3.35	5.05	–	13.4	–	6.6	5.1
11th	–	–	9.98	–	–	–	12.73	-22.7
12th	4.78	–	3.73	–	–	7.78	8.36	-9.08

Note: − Sign before figures indicates negative sign.

Total Bhava Bala:

Add together, the Bhavadhipathi Bala, Bhava Dig Bala and Bhava Drig Bala of each Bhava. The sum total represents the strength of the Bhava.

Total Balas of the twelve Bhavas in Sri Rama's horoscope:

Bhava	Bhavadhi-pathi Bala	Bhava Dig Bala	Bhava Drig Bala	Total Bhava	in Rupas	Order
1st	520.33	0	−12.9	507.43	8.46	IV
2nd	613.425	20	−60.125	573.28	9.55	II
3rd	429.675	40	−29.562	440.113	7.34	VII
4th	362.873	30	25.125	417.998	6.97	X
5th	372.505	50	−28.125	394.387	6.57	XI
6th	552.392	10	− 2.7	557.697	9.29	III
7th	401.873	30	46.55	478.423	7.97	V
8th	404.873	10	35.475	450.348	7.5	VIII
9th	550.397	10	31.862	592.259	9.87	I
10th	372.505	60	5.1	437.605	7.29	IX
11th	362.873	50	−22.7	390.173	6.5	XII
12th	429.675	50	− 9.087	470.588	7.84	VI

Note: − sign before figures indicate negative value.

ISHTA AND KASHTA PHALAS:

General Observations:

Parasara, Sripathi, Kesava and other writers enable us to measure numerically the extent of good and bad results that would accrue in a particular Dasa. The occupations which natives have to pursue under certain planetary conditions, the effects due to the different bhavas, yogas, aspects and other indications of planets should be assigned suitably according to the strength of planets ruling the Dasas and Bhukthis. In the matter of forming a general opinion regarding the extent of good and evil that is likely to happen during a particular Dasa or a Bhukthi, the Ishta (good) and Kashta (bad) Phalas of the respective lords would be immensely helpful.

Sun's·Chesta Kendra:

Ravi has no Chesta Kendra or Chesta Bala as he never gets into retrogression. But still a method is prescribed to find his Chesta Bala which is necessary to ascertain the Ishta and Kashta Phalas.

Add 90°.0 to Sun's sayana longitude. The result is Chesta Kendra; dividing this by 3 we get his Chesta Bala.

Sun's Chesta Bala in Sri Rama's horoscope:

Nirayana longitude of Sun	9°.0
Less Ayanamsa	19°.965
Sayna longitude of Sun	349°.035

Since Sun's Chesta Kendra exceeds 180°.0, **subtra**ct from 360°.0.

360°.0 - 349.035 = 10°.965

Sun's Chesta Bala = 10°.965/3 = 3.655 Shasti amsas.

Chesta Bala of Moon:

Subtract the Sun's longitude from that of the Moon and the latter's Chesta Kendra is obtained. If the remainder exceeds 180°.0, subtract it from 360° and divide the result by 3 to get the Chesta Bala.

Moon's Chesta Bala in Sri Rama's horoscope:

Moon's longitude	90°.0
Sun's longitude	9°.0
Moon's Chesta Kendra	81°.0

Dividing by 3, we get 27 Shasti amsas.

Determination of Ishta Phala:

The Ishta portion of a planet's influence is obtained thus:

The Ochcha Bala (exaltation strength) of a planet is multiplied by its Chesta Bala and the square root of the product extracted. The result would represent the Ishta Phala.

Ishta Bhala of planets in Sri Rama's horoscope:

Sun;	$\sqrt{60 \times 3.655}$	=	14.81 Shasti amsas.
Moon;	$\sqrt{41 \times 27}$	=	33.27 " "
Kuja;	$\sqrt{60 \times 34.195}$	=	45.29 " "
Budha;	$\sqrt{12 \times 17.485}$	=	14.49 "
Guru;	$\sqrt{58 \times 25.332}$	=	38.33 " "
Sukra;	$\sqrt{60 \times 29.528}$	=	42.09 " "
Sani;	$\sqrt{60 \times 59.508}$	=	59.75 " "

Determination of Kashta Bhala:

The square root of the product of 60 minus ochcha bala and 60 minus Chesta bala gives the amount of Kashta influence in Shasti amsas.

Determination of Kashta Bhala in Sri Rama's horoscope:

Kashta Bhala = (60 − Occha Bala) (60 − Chesta Bala)

Sun;	$\sqrt{(60 - 60)\ (60 - 3.655}$	=	0
Moon;	$\sqrt{(60 - 41)\ (60 - 27)}$	=	25.04
Kuja;	$\sqrt{(60 - 60)\ (60 - 34.195)}$	=	0
Budha;	$\sqrt{(60 - 12)\ (60 - 17.485)}$	=	45.17
Guru;	$\sqrt{(60 - 58)\ (60 - 25.332)}$	=	8.33
Sukra;	$\sqrt{(60 - 60)\ (60 - 29.528)}$	=	0
Sani;	$\sqrt{(60 - 60)\ (60 - 59.508)}$	=	0

In a land destitute of a ruler the thundering cloud wreathed with lightning does not drench the earth with rain water.

Ayodhya Kanda - Canto 67 - Verse 9

CHAPTER VIII

ASHTAKAVARGA

In Hindu astrology, Gochara system plays a unique roll. In Valmiki Ramayana there are references about the effects produced by the planets during their transits in the various houses. Thus since the age of Rama this system is being practised by the Hindu astrologers to compute the strength of the planets during transit, assess the timings of events, predict the future happenings etc. In this system, the house of the Moon is taken as the first house. The transits are based on the Niryayana chart. Left to individuals different interpretations and timing of events may occur , however well versed and experienced they may be in the art of prediction. So this system is recommended since it prescribes certain numerically measured units for uniform application by all who predict by the Gochara system. The strength of a planet during its transit is assessed by the bindus it gets. Generally, a planet is said to be benefic, if it gets over five bindus in his own ashtakavarga house etc. If it gets less than four, it is generally considered as unfavourable. The maximum that could be secured by a planet is 8 bindus. Sri Rama's horoscope has been cast almost exhaustively earlier. The author takes this as standard horoscope and has worked out the bindus secured by different planets in various houses, charted and sorted them out and processed them to assess the strength for the required purposes, predictions etc. This enables the reader to study them in detail, verify the results and judge for himself how correct the happenings were as per the diary of Sri Rama in Chapter X of this book.

Ashtakavarga Charts - Individual or Binnaashtaka Varga:

The following Table gives the positions of Sun and the other planets up to Sani which are favourable from themselves and Lagna, to occupy since they vary their places due to their continuous motions.

	Ravi 48	Moon 49	Kuja 39	Budha 54	Guru 56	Sukra 52	Sani 39
Sun	1,2,4,7 8,9,10, 11	3,6,7, 10,11 11	8,5,6 10,11	5,6,9 11,12	1,2,3, 4,7,8 9,10, 11	8,11, 12 11	1,2,4, 7,8,10,
Moon	3,6,10, 11	1,3,6, 7,10 11	3,6,11	2,4,6, 8,10, 11	2,5,7, 9,11	1,2,3, 4,5,8. 9,11, 12	3,6,11
Kuja	1,2,4 7,8,9, 10,11	2,3,5, 6,9,10 11	1,2,4, 7,8,10 11	1,2,4 7,8,9 10,11	1,2,4, 7,8 10,11	3,5,6, 9,11, 12	3,5,6, 10,11 12
Budha	3,5,6, 9,10, 11,12	1,3,4, 5,7,8, 10,11	3,5,6, 11	1,3,5, 6,9, 10,11	1,2,4, 5,6,9, 10,11	3,5,6, 9,11	6,8,9, 10,11 12
Guru	5,6,9, 11	1,4,7, 8,10, 11,12	6,10, 11,12	6,8,11 12	1,2,3, 4,7,8, 10,11	5,8,9, 10,11	5,6,11 12
Sukra	6,7,12	3,4,5 7,9, 10,11	6,8 11,12	1,2,3, 4,5,8, 9,11	2,5,6, 9,10 11	1,2,3, 4,5,8, 9,10 11	6,11 12
Sani	1,2,4,7,8, 9,10,11	3,5,6, 11	1,4,7, 8,9,10 11	1,2,4, 7,8,9, 10,11	3,5,6, 12	3,4,5, 8,9,11	3,5,6, 11
Lagna	3,4,6, 10,11,12	3,6, 10,11	1,3,6, 10,11	1,2,4, 6,8, 10,11	1,2,4, 5,6,7 9,10, 11	1,2,3, 4,5,8 9,11	1,3,4, 6,10 11

<table>
<tr><td></td><td>Sun
0</td><td>0</td><td></td></tr>
<tr><td>0</td><td colspan="2" rowspan="2">Chart 1
Sun's
Ashtavarga
from
Sun</td><td>0</td></tr>
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<tr><td></td><td colspan="2" rowspan="2">Chart 2
Sun's
Ashtavarga
from
Moon</td><td>Moon</td></tr>
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<tr><td>0</td><td colspan="2" rowspan="2">Chart 3
Sun's
Ashtavarga
from
Kuja</td><td>0</td></tr>
<tr><td>Kuja
0</td><td>0</td></tr>
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<tr><td>0</td><td colspan="2" rowspan="2">Chart 4
Sun's
Ashtavarga
from
Budha</td><td></td></tr>
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<tr><td></td><td colspan="2" rowspan="2">Chart 5
Sun's
Ashtavarga
from
Guru</td><td>Guru</td></tr>
<tr><td></td><td></td></tr>
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<tr><td>Sukra</td><td></td><td></td><td></td></tr>
<tr><td>0</td><td colspan="2" rowspan="2">Chart 6
Sun's
Ashtavarga
from
Sukra</td><td></td></tr>
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</table>

	0	0	0
	Chart 7 Sun's Ashtavarga from Sani		0
0			0
	0	0	

	0	0	0
	Chart 8 Sun's Ashtavarga from Lagna		Lagna
0		0	0

SARVASHTAKAVARGA

2	5	5	3
4	Sun's Ashtakavarga-48		3
4			4
5	4	4	5

1	5	5	4
5	Moon's Ashtakavarga-49		4
6			3
4	3	4	5

—	4	5	3
3	Mars Ashtakavarga-39		4
5			5
3	1	3	3

3	6	5	5
6	Budha's Ashtakavarga-54		4
4			5
5	3	5	3

3	6	5	1
5	Guru's Ashtakavarga-56		6
7			6
5	5	4	3

6	2	6	5
6	Sukra's Ashtakavarga-52		4
2			4
4	6	3	4

3	2	5	2
4	Sani's Ashtakavarga-39		2
3			2
6	4	3	3

18	30	36	23
33	Sarva Ashtakavarga-337		27
31			29
32	26	26	26

TRIKONA REDUCTION

0	1	2	0
4	Guru's Ashtakavarga-After I Reduction		3
4			1
0	2	3	0

2	0	4	2
3	Sukra's Ashtakavarga-After I Reduction		0
0			2
2	2	0	2

1	0	2	0
2	Sani's Ashtakavarga-After I Reduction		0
0			0
4	2	1	0

EKATIPATYA OR REDUCTION II

0	1	0	0
0	RAVI		0
0			0
0	1	1	0

0	2	0	0
0	CHANDRA		3
1			0
0	0	0	0

0	1	0	0
0	KUJA		4
2			2
0	0	0	0

0	1	0	0
0	BUDHA		1
1			0
0	0	0	0

EKATHIPATYA OR REDUCTION II

0	1	0	0
0	GURU		3
4			1
0	1	3	0

2	0	0	0
0	SUKRA		0
0			2
0	0	0	0

1	0	1	0
0	SANI		0
0			0
1	0	1	0

According to the degree of virtue and sin practised in one's past life one rules over the world, another simply supports one's race; a third actually sinks into hell, and yet another is respected in heaven.

Valmiki Ramayana Ayodhya Kanda
· Canto 109 · Verse 15

RESULTS OF REDUCTIONS I & II

B-Before Reduction　　　　　　A-After Reduction

	Ravi		Moon		Kuja		Budha		Guru		Sukra		Sani		Total	
	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A
Mesha	1	1	2	2	1	1	1	1	1	1	0	0	0	0	6	6
Rishaba	1	0	0	0	2	0	2	0	2	0	4	0	2	1	13	1
Mithuna	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
Kataka	1	0	3	3	4	4	1	1	3	3	0	0	0	0	12	11
Simha	0	0	0	0	2	2	0	0	1	1	2	2	0	0	5	5
Kanya	1	0	0	0	0	0	0	0	0	0	2	0	0	0	3	1
Thula	1	1	0	0	0	0	0	0	3	3	0	0	1	1	5	5
Vrischi-Ka	2	0	2	0	1	0	0	0	2	1	2	0	2	0	10	1
Dhanus	1	0	1	0	0	0	0	0	0	0	2	0	4	1	8	1
Makara	0	0	1	1	2	2	1	1	4	4	0	0	0	0	8	8
Kumba	1	0	1	0	0	0	1	0	4	0	3	0	2	0	12	0
Meena	0	0	0	0	0	0	0	0	0	0	2	2	1	1	3	3

MANDALA SODANA

6	6	0	0
9	Corrected Sarva Ashtakavarga		3
7			5
8	2	2	2

4	1	0	7
7	Sarva Ashtakavarga After I Reduction		1
7			0
3	0	0	2

4	1	0	2
0	Sarva Ashtakavarga-	After II Reduction	1
7			0
0	0	0	2

38	26	20	33
23	Sarva Ashtakavarga-	(Rekhas)	29
25			27
24	30	30	30

2	2	8	9
11	Corrected Sarva	Ashtakavarga- (Rekhas)	5
1			3
0	6	6	6

0	2	7	3
5	Rekhas After	I Reduction	4
0			1
0	4	0	5

0	2	0	3
0	Rekhas After	II Reduction	4
0			3
0	2	0	3

RAVI'S PARASTHARASHTAKAVARGA

	Mesha	Rishaba	Mithuna	Kataka	Simha	Kanya	Thula	Vrishika	Dhanus	Makara	Kumba	Meena	Total
	Ravi Budha			Lagna Moon Guru			Sani			Kuja		Sukra	
Sani	0	0	0	0	0		0	0		0			8
Guru		0						0	0			0	4
Kuja	0			0	0	0	0	0		0	0		8
Surya	0	0		0			0	0		0	0		7
Sukra			0		0	0			0		0		4
Budha			0		0	0			0	0	0	0	7
Moon	0	0				0			0				4
Lagna	0	0	0			0	0		0		-		6
Total	5	5	3	3	4	5	4	4	5	4	4	2	48

Sins perpetrated by blundering men were like-wise punished by other rulers of the earth too. Besides this, people undergo expiation themselves and through such expiation that sin which is expiated gets neutralized.

- Kishkinda Kanda - Canto 18 - Verse 34

MOON'S PARASTHARASTAKAVARGA

	Kataka	Simha	Kanya	Tula	Vrishchika	Dhanus	Makara	Kumba	Meena	Mesha	Rishaba	Mithuna	Total
	Lagna Moon Guru			Sani			Kuja			Sukra	Ravi Budha		
Sani		0				0		0	0				4
Guru	0			0		0	0	0		0	0	0	8
Kuja		0	0	0			0	0		0	0		7
Ravi			0	0	0		0	0				0	6
Sukra	0		0		0		0				0	0	6
Budha	0	0		0	0		0	0		0		0	8
Moon	0		0			0	0			0	0		6
Lagna			0			0				0	0		4
Total	4	3	5	4	3	4	6	4	1	5	5	4	49

Men who having perpetrated sins, have been subjected to punishment by kings, become stainless and ascend to heaven like those who have performed meritorious deeds.

- Kishkinda Kanda - Canto 18 - Verse 31

KUJA'S PARASTHARASHTAKAVARGA

	Makara	Kumba	Meena	Mesha	Rishaba	Mithuna		Simha	Kanya	Tula	Vrishchika	Dhanus	Total
	Kuja		Sukra	Budha			Lagna Moon Guru						
Sani	0			0	0	0	0	0		0			7
Guru				0	0	0						0	4
Kuja	0	0		0			0	0		0	0		7
Ravi	0	0						0	0				4
Sukra	0	0						0		0			4
Budha	0				0		0	0					4
Moon					0	0			0			0	4
Lagna				0	0		0		0			0	5
Total	5	3	–	4	5	3	4	5	3	3	1	3	37

A thief, in particular and a sinner in general, gets fully absolved from sin either through punishment or by being let go free by way of mercy. A king, not punishing a sinner, however, incurs his sin.

- Kishkinda Kanda - Canto 18 - Verse 32

BUDHA'S PARASTHARASHTAKAVARGA

	Mesha	Vrishchika	Mithuna	Kataka	Simha	Kanya	Tula	Vrishchika	Dhanus	Makara	Kumba	Meena	Total
	Ravi Budha			Lagna Moon Guru			Sani			Kuja		Sukra	
Sani	0	0	0	0	0		0	0		0			8
Guru		0	0						0		0		4
Kuja	0			0	0	0	0	0		0	0		8
Ravi			0			0			0		0	0	5
Sukra	0	0	0	0			0	0		0		0	8
Budha	0		0		0	0			0	0	0	0	8
Moon	0	0			0		0		0		0		6
Lagna	0	0		0	0		0		0		0		7
Total	6	5	5	4	5	3	5	3	5	4	6	3	54

A man who has transgressed the bounds of propriety and is characterised a sinful conduct and who is wedded to a moral philosophy different from the established ethical doctrines does not get recognition among the wise.

Valmiki Ramayana - Canto 109 - Verse 3.

GURU'S PARASTHARASHTAKAVARGA

	Kataka	Simha	Kanya	Tula	Vrishchika	Dhanus	Makara	Kumba	Meena	Mesha	Rishaba	Mithuna	Total
	Lagna Moon Guru			Sani			Kuja		Sukra	Ravi Budha			
Sani			0			0		0	0				4
Guru	0	0	0	0			0	0		0	0		8
Kuja	0	0		0	0		0	0		0			7
Ravi	0			0	0	0	0	0		0	0	0	9
Sukra	0	0		0	0	0				0			6
Budha	0	0	0			0	0	0		0	0		8
Moon		0			0		0		0		0		5
Lagna	0	0		0	0	0	0		0	0	0		9
Total	6	6	3	4	5	5	7	5	3	6	5	1	56

In a rulerless land handfuls of seeds are no longer scattered for fear of uncertainty of crops. Nay. In a rulerless land a son is not amenable to the control of his father nor is a wife amenable to the control of her husband.

Valmiki Ramayana - Kalyana Kalpataru

SUKRA'S PARASTHARASHTAKAVARGA

	Meena	Mesha	Rishaba	Mithuna	Kataka	Simha	Kanya	Tula	Vrishchika	Dhanus	Makara	Kumba	Total
	Sukra	Ravi Budha			Lagna Moon Guru			Sani			Kuja		
Sani			0	0	0	0				0	0	0	7
Guru	0	0	0						0			0	5
Kuja	0		0	0			0		0	0			6
Ravi	0								0			0	3
Sukra	0	0	0	0	0			0	0	0	0		9
Budha				0		0	0			0		0	5
Moon	0		0	0	0	0	0	0	0			0	9
Lagna	0		0		0	0	0	0	0			0	8
Total	6	2	6	5	4	4	4	3	5	4	2	6	52

With her pleasing countenance in the form of the moon perceptible and her lovely eyes in the form of the hosts of stars opened and with her mantle of moonshine wrapped round her body, the night books like a woman who has her limbs covered with a white cloth.

- Kishkinda Kanda - Canto 39 - Verse 46

SANI'S PARASTHARASHTAKAVARGA

	Tula	Vrishchika	Dhanus	Makara	Kumba	Meena	Mesha	Vrishaba	Mithuna	Kataka	Simha	Kanya	Total
	Sani			Kuja			Sukra	Ravi Budha		Lagna Moon Guru			
Sani			0		0	0					0		4
Guru		0	0					0	0				4
Kuja	0	0	0			0		0	0				6
Ravi	0	0		0	0			0		0			6
Sukra				0	0		0				0		4
Budha		0	0	0	0	0						0	6
Moon			0					0				0	3
Lagna	0		0				0	0		0		0	6
Total	3	4	6	3	4	3	2	5	2	2	2	3	39

He who does not awaken even though committing sins through greed or concupiscence, and feels delighted in doing so, sees with his own eyes the end of sinful deeds along with his own like a venomless lizard which perceives its own end through the eating of hailstones.

- Aranya Kanda - Canto 29 - Verse 5

CHAPTER IX.

CALCULATION OF DASA, BUKTHI, ANTHARA PERIODS.

Dasa Bukthi Periods of Sri Rama as per his age:

Dasa	Bukthi	Period			Age					
					From			to		
		Y	M	D	Y	M	D	Y	M	D
Guru					0	0	0	4	0	0
Sani	Sani	3	0	3	4	0	0	7	0	3
"	Budha	2	8	9	7	0	3	[illegible]	8	12
"	Ketu	1	1	9	9	8	12	10	9	21
"	Sukra	3	2	0	10	9	21	13	11	21
"	Ravi	0	11	12	13	11	21	14	11	3
"	Moon	1	7	0	14	11	3	16	6	3
"	Kuja	1	1	9	16	6	3	17	7	12
"	Rahu	2	10	6	17	7	12	20	5	18
"	Guru	2	6	12	20	5	18	23	0	0
Budha	Budha	2	4	27	23	0	0	25	4	27
"	Ketu	0	11	27	23	4	27	26	4	24
"	Sukra	2	10	0	26	4	24	29	2	24
"	Ravi	0	10	6	29	2	24	30	1	0
"	Moon	1	5	0	30	1	0	31	6	0
"	Kuja	0	11	27	31	6	0	32	5	27
"	Rahu	2	6	18	32	5	27	34	12	15
"	Guru	2	3	6	34	12	15	37	3	21
"	Sani	2	8	9	37	3	21	40	0	0
etc.	etc.					etc.			etc.	

SRI RAMA'S DASA, BUKTHI, ANTARA PERIODS AND EVENTS:

Dasa	Bukthi	Antara	Period in Julian Days and corresponding English Dates in B.C. From	To	Events
1	2	3	4	5	6
Guru			102311 11-2-4433	103751 21.1.4429	Janmas of Sri Rama and brothers.
Sani	Sani	–	103751 21.1.4429	104834 8.1.4426	
"	Budha	–	104834 8.1.4426	105803 3.9.4424	
"	Ketu		105803 3.9.4424	106202 7.10.4423	
"	Sukra	Sukra	106202 7.10.4423	106392 15.4.4422	
"	"	Ravi	106392 15.4.4422	106449 11.6.4422	
"	"	Moon	106449 11.6.4422	106544 14.9.4422	
"	"	Kuja	106544 14.9.4422	106610 19.11.4422	
"	"	Rahu	106610 19.11.4422	106781 9.5.4421	Sri Rama's sudden departure with Viswamitra; Sita Rama wedding and return to Ayodhya.
"	"	Guru	106781 9.5.4421	106933 8.10.4421	Happy stay at Ayodhya.

"	"	Sani	106933 8.10.4421	107114 6.4.4420	
"	"	Budha	107114 6.4.4420	107275 14.9.4420	
"	"	Ketu	107275 14.9.4420	107342 20.11.4420	
Sani	Ravi		107342 20.11.4420	107684 28.10.4419	
"	Moon		107684 28.10.4419	108254 21.5.4417	
"	Kuja		108254 21.5.4417	108653 23.6.4416	
"	Rahu		108653 23.6.4416	109679 15.4.4413	
"	Guru		109679 15.4.4413	110591 13.10.4411	
Budha	Budha	Budha	110591 13.10.4411	110713 12.2.4410	
"	"	Ketu	110713 12.2.4410	110764 4.4.4410	
"	"	Sukra	110764 4.4.4410	110908 26.8.4410	
"	"	Ravi	110908 26.8.4410	110952 9.10.4410	
"	"	Moon	110952 9.10.4410	111024 20.12.4410	
"	"	Kuja	111024 20.12.4410	111075 9.2.4409	
"	"	Rahu	111075 9.2.4409	111205 18.6.4409	Sri Ram's 25th Birth Day. Arrangements for the coronation

					— sudden departure on exile — demise of Dasaratha — Paduka Pattabishekam —. Sri Rama's departure from Chitrakuta and reaching the ashrama of Suthikshna — commencement of stay in different ashrams.
Budha	Budha	Guru	111205 18.6.4409	111320 12.10.4409	Stay of Sri Rama and party in various ashrams by rotation till the completion of the tenth year of exile.
"	"	Sani	111320 12.10.4409	111458 26.2.4408	
"	Ketu		111458 26.2.4408	111815 18.2.4407	
"	Sukra		111815 18.2.4407	112835 5.12.4405	
"	Ravi		112835 5.12.4405	5.10.4404	
"	Moon		113141 5.10.4404	113651 27.2.4402	

"	Kuja		113651 27.2.4402	114008 19.2.4401	
"	Rahu		114008 19.2.4401	114926 26.8.4399	Śri Rama's 35th Birth Day; meets sage Agastya; stay at panc-chavati.
"	Guru	Guru	114926 26.8.4399	115034 12.12.4399	
"	"	Sani	115034 12.12.4309	115163 21.4.4398	
"	"	Budha	115163 21.4.4398	115279 14.8.4398	
"	"	Ketu	115279 14.8.4398	115327 1.10.4398	
"	"	Sukra	15327 1.10.43	115463 14.2.4397	
"	"	Ravi	115463 14.2.4397	115504 27.3.4397	
"	"	Moon	115504 27.3.4397	115572 3.6.4397	
"	"	Kuja	115572 3.6.4397	115619 20.7.4397	
Budha	Guru	Rahu	115619 20.7.4397	115742 20.11.4397	Surpanaka's visit and Ravana abducts Sita
"	Sani	Sani	115742 20.11.4397	115895 21.4.4396	Surpanaka episode — Sri Rama's 38th Birth Day — Ravana abducts Sita — Sri Rama in search of Sita.

"	"	Budha	115895 21.4.4396	116032 5.9.4396	
"	"	Ketu	116032 5.9.4396	116089 1.11.4396	
"	"	Sukra	116089 1.11.4396	116250 11.4.4395	Sri Rama meets Sugriva; Vali vada; Hanuman's jump to Lanka and his meeting Sita; Sri Rama's sudden departure for Lanka; construction of the bridge; annihilation of Ravana & his race; Sri Rama's return to Ayodhya and coronation as king of Ayodhya.
etc	etc	etc	etc	etc	etc.

Just as the eyes ever strive for the good of the body by showing it the right path, so does the king, who is the fountain of truth and righteousness, ever strive for the good of the state.

- Ayodhya Kanda - Canto 67 - Verse 33

CHAPTER X.

SRI RAMA'S DIARY

Anything worth doing is worth doing well. If we wish to study the events in the Ramayana with regard to their timings, it is better to do so in a systematic and mathematical way. In about 125 instances, Valmiki has mentioned about the titi, nakshatra, etc., in point of time, directly or indirectly, of certain events. If we study them casually or taken out of their context we do not get any clear overall picture. At times more confustion arises. Information regarding certain important events is not available; for instance the days exceeded by Angada over the days fixed by Sugriva to search for Sita and the days taken by Sri Rama and the Vanara army to reach the sea shore after their departure from Rishyamukha Hill, etc. Different commentators give different days. Why should this be so? Has Valmiki left any ambiguity about these events? Valmiki would and should have given complete information required by any person who seeks it in his epic which is like any modern encyclopaedia. With this strong faith, the author made an attempt to collect and sort out all the information furnished by the poet and arranged them in a chronological order. The date of birth of Sri Rama arrived at viz., the 11th February, 4433 B.C., while casting the detailed horoscope in Chapter II is the basis of the calculations. A judicious method to find out the corresponding Julian Day, the English date in B.C., week day, Baarhaspatya Varsha, Masa, Paksha, Titi, Nakshatra, Dasa, Bukthi, Antara Periods, etc., was suitably devised and adopted.

Except for a few gaps of some uneventful periods, like Sri Rama's stay in Ayodhya after his return following his marriage till the day of the proposal for his coronationas Yuva Raja, stay in the asram of Sutheekshna and Panchavati after the lapse of ten years of his exile, etc., Valmiki has almost given an account of the day-to-day activities. All these accounts have been adopted as given by Valmiki under his own authority. Nothing has been assumed out of imagination or intellectual speculation.

The venture is rewarded with good results by His Grace. Not only the timings of the events got well defined and fitted in, but the missing links also got unfolded wonderfully. The results obtained indicate that it is like the diary of the events in Ramayana, with continuity and consistency, presenting a vivid picture with clearness and precision and highlighting certain interesting features. The results are now placed before the readers.

SRI RAMA'S DIARY

Julian Day Date in B.C. Week Day	Year Month Paksha Titi at midnight	Nakshatra at midnight in degrees	Events
	in figures & at sunrise in letters		
102311 11.2.4433 Sunday	Prabhava Chaitra Sukla Navami 8.19	Punarvasu 84.07/ Pushya	BIRTH OF SRI RAMA
102312 12.2.4433 Monday	Chaitra Sukla Dasami 9.2	Pushya 97.25/ Aslesha	Births of Sri Lakshmana and Sri Satrugna
102323 23.2.4433 Friday	Chaitra Krishna Sashti 20.38	Moola 242.19	Namakarna function was conducted by Sage Vasishta on the completion of the 11th day i.e., on the 12th day.
106682 30.1.4421 Wednesday	Pramadhi Chaitra Sukla Navami 8.67	Ardra 78.11	Sri Rama's 13th Birthday. SANI DASA, SUKRA BUKTHI, RAHU ANTARA:

106689 6.2.4421 Wednesday	Pramadhi Chaitra Krishna Pratama 15.78	Hasta 170.17	Viswamitra arrived unexpectedly and requested Dasaratha to entrust Sri Rama to his care for ten nights (I.20.19) to defeat the two asuras who are hindering his Yagna. Sri Rama and Lakshmana accompanied Viswamitra. All the three walked 6 miles (I.22.10) along the southern bank of the Sarayu river. Viswamitra initiated the Princes in two secret mantras Bala and Atibala (I.22.15). They all slept that night on the south bank of Sarayu river. (I.22.22)
106690 7.2.4421 Thursday	Pramadhi Chaitra Bahula Dwitiya 16.8	Chaitra 183.34	They reached Kamashrama which was between the rivers Sarayu and Tripathaga in Agna Desa. (I.23.16) Princes were presented to the Ashramites. Viswamitra recounted to the Princes the history of the Ashram. They spent the night as guests of the rishis. (I.23.22)
106691 8.2.4421 Friday	Pramadhi Chaitra Bahula Tritiya 17.81	Swathi 196.52	They all set out, reached the bank of the river Tripathaga, crossed it by boat and reached Tataka vana. At midstream they

			offered homage to the river. Viswamitra recounted the history of Tataka. Tataka was killed. They spent the night in the Tataka vana.(I.26.36)
106692 9.2.4421 Saturday	Pramadi Chaitra Bahula Chaturti 18.83	Vishaka 209.7	They proceeded to Viswamitra's Sidha Ashrama. On the way, Viswamitra presented Sri Rama with all the divine Astras and taught him their use. Viswamitra took vow for the yagna that night itself. They spent the night there. (I.29.32)
106693 10.2.4421 Sunday	Pramadi Chaitra Bahula Panchami 19.85	Anurada 222.87	Princes, duly and fully armed, kept vigil for six nights and six days when the Yagna was going on. (I.30.6)
to	to	to	
106698 15.2.4421 Friday	Pramadi Chaitra Bahula Dasami 24.92	Shravana 288.75	On the sixth day, the rakshasas Mareecha and Subahu appeared on the site. Subahu was killed. Mareecha was destroyed. Viswamitra was happy. **NOTE. This night coincides with the ten nights as requested by Viswamitra from Dasaratha (I.19.118)**

106699 16.2.4421 Saturday	Pramadi Chaitra Bahula Ekadasi 25.94	Dhanishta 301.93	As suggested and led by Viswamitra they all proceeded to Mithila. In the evening they reached Sona river. They rested for the night there. Viswamitra recounted to the Princes the history of the place, till mid-night, when the Moon just rose. (I.34.15) **NOTE: Only in Bahula Ekadasi, the Moon rises at mid-night. This Ekadasi coincides with the Ekadasi in our chart. This proves that all our above calculations are true and correct.**
106700 17.2.4421 Sunday	Pramadi Chaitra Bahula Dwadasi 26.96	Sathabishag 315.11	They all continued their journey, crossed the river Sona and reached river Ganga by noon. They bathed in the holy river and after meal, sat around Viswamitra, who told them the story of Ganga. They all spent the night in the shore of Ganga. (I.45.3)
106701 18.2.4421 Monday	Pramadi Chaitra Bahula Trayodasi 27.97	Purva Bhadrapada 328.28	They crossed the river Ganga, reached the northern bank, saw Vishala City and stayed for the night there as the guests of King Sumatra. (I.48.10)

106702 19.2.4421 Tuesday	Pramadi Chaitra Bahula Chaturdasi 28.99 and later Amavasya 30.05	Uttara Bhadrapada 341.46	They all resumed their journey. They reached Gautama's Ashram. Viswamitra recounted the story of Ahalya followed by her Sapa Moksha. They then reached the Yagasala in Mithila, where the Yagna was in progress with 12 days more for completion. Sage Sadananda, Preceptor of Janaka, received Viswamitra and recounted to the Princes the story of Viswamitra. They spent the night there. (I.65.36)
106703 20.2.4421 Wednesday	Pramadi Vaishaka Sukla Pratama 0.004	Revati 354.64	In the morning, Viswamitra introduced the Princes to Janaka and asked him to show the bow to them. On Janaka's orders, the bow was brought. Sri Rama effortlessly lifted it and drew the string back when the mighty bow snapped with a crash like a clap of thunder.
106704 21.2.4421 Thursday	Pramadi Vaishaka Sukla Dwitiya 1.019	Aswini 7.81	As advised by Viswamitra, Janaka sent his swiftest messengers to Ayodhya to give the happy news to Dasaratha and invite him.

106707 24.2.4421 Sunday	Pramadi Vaishaka Sukla Panchami 4.07	Rohini 47.34	After three nights, messengers reached Ayodhya and conveyed the message to king Dasaratha, who then decided to leave for Mithila the next day.
106708 25.2.4421 Monday	Pramadi Vaishaka Sukla Sashti 5.08	Mrigasirsha 60.51	Dasaratha left for Mithila with his retinue.
106712 1.3.4421 Friday	Pramadi Vaishaka Sukla Dasami 9.15	Aslesha 113.22	After four days of journey, Dasaratha reached Mithila (I.69.1) and met Janaka who welcomed him, with customary courtesies.
106713 2.3.4421 Saturday.	Pramadi Vaishaka Sukla Ekadasi 10.16	Makha 126.4 (I.71.23)	Balance of 12 days of Janaka's Yagna got completed this day (I.71.23). Nischayatartha function was done forthwith in Makha Nakshatra (I.71.23) **NOTE: Makha Nakshatra of Valmiki tallies with that of our chart.**
106714 3.3.4421 Sunday	Pramadi Vaishaka Sukla Dwadasi 11.18	Purva Palguna 139.58	Godhana etc., was done (I.72.2)
106715 4.3.4421 Monday	Pramadi Vaishaka Sukla Trayodasi 12.2	Uttara Phalguna 152.75 (I. 71.24)	WEDDING OF SITA AND RAMA at the appointed day and time. **NOTE: Nakshatra of our chart coincides with that given by Valmiki in I.71.24**

106716 5.3.4421 Tuesday	Pramadi Vaisaka Sukla Chaturdasi 13.21	Hasta 165.93	Viswamitra abruptly left for Himalayas. (I.74.2). Dasaratha took leave of Janaka and left for Ayodhya with the Princes and their wives and his retinue. Enroute occurred the encounter with Parasurama and his subjugation. After they reached Ayodhya, they lived happily with their spouses, for nearly twelve years till the 25th Birth Day of Sri Rama.
111081 15.2.4409 Saturday	Kara Chaitra Sukla Ashtami 7.59	Punarvasu 80.73	Sri Rama's 25th Birth Day. Dasaratha thought of crowning Sri Rama as Yuvaraja. He had the Raja Sabha convened immediately. He sought the permission of the members to do so. All in that great assembly acclaimed with one voice and in joy "so be it". He then promptly ordered for all the preparations for the Pattabisheka function on the very next day.
111082 16.2.4409 Sunday	Kara Chaitra Sukla Navami 8.61	Pushya 93.91	Arrangements were in full swing for the Pattabisheka ceremony of Sri Rama. The city was in a festive mood and in a joyous commotion of expectations. Overnight

			developments in a dramatic way in the inner apartments made Sri Rama leave abruptly for vana vasa (for the fulfilment of his avatar) with Sita and Lakshmana. They reached Thamasa river and spent the night on the northern bank (II.46.15)
111083 17.2.4409 Monday	Khara Chaitra Sukla Dasami 9.63	Aslesha 107.09	They crossed Tamasa river long before dawn and travelled far into the forest crossing several streams. They reached the southern boundary of Khosala country. They spent the night there (II.49.2).
111084 18.2.4409 Tuesday	Khara Chaitra Sukla Ekadasi 10.64	Makha 120.26	At dawn, after sandhyavandanam, they resumed their journey forward, till the chariot reached the northern bank of river Ganga. They proceeded along the bank till they found a spot of surpassing charm to spend the night there (II.50.57). Guha, Chief of the region

			welcomed and greeted them with a warm embrace.
111085 19.2.4409 Wednesday	Khara Chaitra Sukla Dwadasi 11.66	Purva Palguni 133.44	At dawn, the Princes got their locks matted with the milk of the banyan. They bid farewell to Sumantra and Guha and crossed the river by boat. At mid stream Sita offered prayers to the Goddess Ganga. After reaching the southern bank, they proceeded further till they reached a banyan tree. They spent the night under the tree. Sri Lakshmana kept vigil the whole night, as they were alone unattended by friends.
111086 20.2.4409 Thursday	Khara Chaitra Sukla Trayodasi 12.68	Uttara Palguni 146.62	At day dawn, the three left for the Ashram of Sage Bharadwaja, reached at dusk and spent the night there as welcome guests of the Sage (II.54.35) Just after dusk, Sumantra should have got indications by some quick communication, perhaps more or less akin to our present day wireless system, that Sri Rama with Sita and Sri Lakshmana reached the ashram of Bharadwaja and on his advice, they

			are intending to go towards Chitra Kuta for their stay (II.57.2).
			Sumantra left immediately for Ayodhya driving the chariot fast.
111087 21.2.4409 Friday	Khara Chaitra Sukla Chaturdasi 13.69 and Paurnami from 7H.. 23m.53s.	Hasta 159.79	At day dawn, Sri Rama with Sita and Sri Lakshmana, sought the guidance of Sage Bharadwaja on the route to follow to Chitrakuta and on his instructions left for Chitrakuta. They reached the river Yamuna and spent the night on its bank.
			Sumantra reached Ayodhya on the second day evening (II.57.5). He promptly reported to Dasaratha the message of Sri Rama and other details. Dasaratha's life slowly ebbed and breathed his last, during his sleep after midnight, by which time the titi Paurnima had set in.
			NOTE. The titi in our chart tallies.
111088 22.2.4409 Saturday	Khara Chaitra Sukla Paurnami 14.71	Chaitra 172.97	Sri Rama and party resumed their journey at day dawn (II.55.1) and reached Chitra kuta hill (II.56.10). Sri Lakshmana constructed a mud hut

			with jungle materials. They performed Vastu Homa etc., and entered the hut (II.56.35). They started living in it happily (II.56.38). At Ayodhya, Vasishta sent swift messengers to Bharata for his immediate return to Ayodhya (II.68.11). The messengers reached the city of Girivaraja and spent the night there. During that night, Bharata had bad dreams.
111089 23.2.4409 Sunday	Khara Chaitra Bahula Pratama 15.72	Swathi 186.15	Sri Bharata was narrating his bad dreams in the Assembly when the messengers reached there to convey the urgent message from Vasishta. Sri Bharata left for Ayodhya immediately (11.70.28). He reached Jambuprastham village in the night and stayed there (11.71.12).

111090 24.2.4409 Monday	Khara Chaitra Bahula Dwitiya 16.74	Vishaka 199.32	Sri Bharata reached the Sarvatita village and spent the second night (II.7.118).
111091 25.2.4409 Tuesday	Khara Chaitra Bahula Tritiya 17.76	Anurada 212.5	Sri Bharata reached Acha Mara Vana and spent the night (11.71.18).
111092 26.2.4409 Wednesday	Khara Chaitra Bahula Chaturti 18.77	Jeyshta 225.67	Sri Bharata continued his journey towards Ayodhya.
111096 2.3.4409 Sunday	Khara Chaitra Bahula Ashtami 22.83	Moola 278.38	In the evening of the 8th day, Sri Bharata reached Ayodhya (II. 71.32). He heard the sad news of his father's demise and lamented the whole night.
111097 3.3.4409 Monday	Khara Chaitra Bahula Navami 23.85	Dhanishta 291.55	Sri Bharata performed the obsequies of his father (II.76.3)
111107 13.3.4409 Thursday	Khara Vaishaka Sukla Pan- chami 4.01	Mrigasirsha, 63.32	Punyavachana ceremony was performed. (II.77.1)

111108 14.3.4409 Friday	Khara Vaisaka Sukla Sashti 5.02	Ardra 76.5	Sri Bharata performed the Shradha ceremony (II.77.1)
111109 15.3.4409 Saturday	Khara Vaisaka Sukla Sap- tami 6.04	Punarvasu 89.67	Sanchayana on the 13th day (II.77.4)
111110 16.3.4409 Sunday	Khara Vaisaka Sukla Ashtami 7.06	Pushya 102.85	On the 14th day, Sri Bharata was requested by Vasishta and the whole assembly to get annointed as the King. He declined and decided to proceed to the forests to bring Sri Rama to enthrone him as the King of Ayodhya and spent the first auspicious night (II.81.1)
111111 17.3.44 Monday	Khara Vaisaka Sukla Navami 8.07	Aslesha 116.02	At dawn and at an auspicious muhurtam Bharata left with his following (II.83.1). He reached the bank of the Ganga in the evening. Guha met and received him. Hosted by Guha, he spent the night there.
111112 18.3.4409 Tuesday	Khara Vaisaka Sukla Dasami 9.09	Makha 129.2	At dawn and at Maitra muhurta they crossed the Ganga by boats arranged by Guha. They reached Bharadwaja s Ashram in the evening. The sage entertained them. They all spent the night at the Ashram.

111113 19.3.4409 Wednesday	Khara Vaisaka Sukla Ekadasi 10.11	Purva Palguna 142.38	In the morning, they left for Chitrakuta, as directed by the sage and met Sri Rama. Sri Bharata informed them about the demise of Dasaratha. They offered libations to Dasaratha. Sri Bharata requested Sri Rama to return to Ayodhya and rule as King. They spent the night (II.103.2)
111114 20.3.4409 Thursday	Khara Vaisaka Sukla Dwadasi 11.12	Uttara Palguna 155.55	Discussions were resumed in the morning. After arguments and counter arguments, it was agreed that Sri Bharata would rule the country with the Padukas of Sri Rama as token till the return of Sri Rama after his exile.. Sri Rama placed his feet on the sandals and handed them over to Sri Bharata. Sri Bharata then started back for Ayodhya.
111115 21.3.4409 Friday	Khara Vaisaka Sukla Trayodasi 12.14	Hasta 168.73	After Sri Bharata's departure, Sri Rama noticed some unhappiness among the ashrama rishis. He learnt that since his arrival rakshasas from Janasthana were troubling them and that they were thinking of shifting from there.

111116 22.3.4409 Saturday	Khara Vaisaka Sukla Chaturdasi 13.15	Chaitra 181.91	The ashramites left the ashram after taking leave of Sri Ráma. Sri Rama too changed his mind and decided to shift from Chitrakuta and left that place with Sita and Sri Lakshmana (II.1.16)
111117 23.3.4409 Sunday	Khara Vaisaka Sukla Paurnami 14.17	Swati 195.08	The Princes and Sita reached the Ashram of Atri. Anasuya presented gifts to Sita. The Sun was setting and the Moon rising. **NOTE: Sunset and Moon rise simultaneously on this day indicates paurnami and tallies with our chart.**
111118 24.3.4409 Monday	Khara Vaisaka Bahula Pratama 15.18	Vishaka 208.26	At dawn they proceeded to a spot where rishis were staying and spent the night there, as guests of rishis (II.2.1)
111119 25.3.4409 Tuesday	Khara Vaisaka Bahula Dwitiya 16.2	Jeyshta 234.61	At dawn, they resumed their journey. En route, they met Viradha, smashed him and buried him. As advised by him, they proceeded to Sharabanga's ashram and reached it in the evening (VI.129.4) After meeting them Sharabanga departed to the world of Indira. The Princes and Sita reached the ashram of Suthikshna and stayed there for the night.

111120 26.3.4409 Wednesday	Khara Vaisaka Bahula Tritiya 17.22	Jeyshta 234.61	At day break, they took leave of Suthikshna, who invited them again and resumed their journey. They saw a beautiful lake from which sweet music was emanating. Getting curious, they enquired from a rishi by name Dharmabrith. He recounted the story. They met a few more rishis and spent some time in their company.
to	to	to	They started living quietly among the rishis a month in one ashram, three months in the second and perhaps one year in the third etc., in rotation, as happy welcome guests, till the end of the 10th year of exile. When they visited Sutikshna's ashram again, the 10th year was completed.
			Budha Dasa, Rahu Bukthi, Ketu Antara
114742 23.2.4399 Saturday	Pilava Chaitra Sukla Saptami 6.79	Punarvasu 79.38	On Sri Rama's fine 35th Birth Day morning and at the commencement of the 11th year of exile, Sri Rama expressed his wish to see Sage Agastya. As advised and directed by the sage, they took leave of him and proceeded

			towards the ashram of Agastya.
114743 24.2.4399 Sunday	Pilava Chaitra Sukla Ashtami 7.81	Pushya 92.56	They visited the ashram of Agastya's younger brother on the way and spent the night there.
114744 25.2.4399 Monday	Pilava Chaitra Sukla Navami 8.82	Aslesha 105.74	In the morning they reached the ashram of Agastya. The Sage warmly welcomed them and presented Brahma Astra. He advised Sri Rama to spend the rest of his exile in Panchavati.
114745 26.2.4399 Tuesday	Pilava Chaitra Sukla Dasami 9.84	Makha 118.91	In the morning, they took leave of Sage Agastya and proceeded towards Panchavati. On their way, they met Jatayu, a huge figure. Jatayu offered that he would take care of Sita whenever the Princes go out. They then reached panchavati. Lakshmana constructed a mud hut. Sri Rama praised him and gave him a warm embrace. They performed religious ceremonies and lived there happily. **Budha Dasa, Guru Bukthi, Rahu Antara**

115815 31.1.4396 Monday to	Krodhi Palguna Bahula Dwitiya 16.85 to	Chitra 177.62 (See Note on III.17.4) to	While the three viz., Sri Rama, Sita and Sri Lakshmana were whiling away the hours after their morning duties, Surpanaka chanced to come to the ashram. After seeing Sri Rama, she made overtures and got her nose and ear multilated by Sri Lakshmana. She then rushed to her brother Khara crying and reported to him. When he intervened, he and his entire army were liquidated by Sri Rama, single handed. She then appeared before Ravana, bleeding and mutilated and sought vengeance. This prompted Ravana to approach Mareecha and made him transform himself as a golden deer to tempt Sita to ask Sri Rama to fetch it for her. The plan clicked.
115835 20.2.4396 Sunday	Krodhi Chaitra Sukla Ashtami 7.16	Punarvasu 81.14	Sri Rama's 38th Birth Day. Ravana abducted Sita. Jatayu threw himself in the way but his wings and talons were cut off by Ravana. Jatayu fell on the ground unable to move. Sri Rama returned to the ashrama where he did

not find Sita. He lamented and roamed about in search of Sita. He saw Jatayu before death and got the information. Sri Rama performed Jatayu's obsiquies. Sri Rama and Lakshmana then met Kabanda. After cutting his arms, they set fire to his body as desired by him. Kabanda asked them to see Sugriva who was staying in Rishyamukha hill.

Then they visited the ashram of Sabari and accepted her hospitality. She then entered the fire and ascended to heaven. The Princes were then roaming about in the forest over the Pampa region, to meet Sugriva. Meanwhile Sugriva became suspicious noticing the movements of the Princes. It was Hanuman who met the Princes and introduced them to Sugriva. Sugriva and Sri Rama entered into a pact of friendship for their mutual benefit. They shared their thoughts. Sugriva revealed his fear from Vali. Sri Rama

to	to	to	made an instantaneous promise to kill Vali and did so. Sri Rama crowned Sugriva as King of Kishkinda. The rainy season began. So the search for Sita had to be stayed, till the end of the rainy season. Sugriva spent his time in enjoyment in Kishkinda. Sri Rama and Lakshmana spent the weary days waiting in a cave nearby, for the month of Karthika to come.

Budha Dasa, Sani Bukthi, Budha Antara

116100 12.11.4396 Saturday	Khrodi Pushya Sukla Saptami 6.38	Purva Bhadrapada 332.88	Sugriva sent vanaras to the four corners of the earth to make a thorough search for Sita and return in a month. He gave them detailed instructions and warned them not to exceed a month on any account.
to	to	to	
116130 12.12.4396 Thursday	Khrodhi Magha Sukla Saptami 6.85	Aswini 8.17 See Note X -2	Last day for the vanaras to return after search for Sita. All the vanaras except those who went Southward returned and reported to Sugriva that they could not locate Sita or Ravana.
to	to	to	

Angada and party were in the cave of a Tapaswini on this day. When they came out of the cave, Angada realised that they have exceeded the target date. They could not locate Sita. Due to fear of Sugriva, Angada decided to fast and seek death. Vanaras were recalling the past and talking to one another. When they recounted about Jatayu and his death, Sampati who happened to be there overheard the discussion. He was grieved to learn about the demise of his brother. Making good use of his capacity to look at distant objects, he informed them that he could locate Sita in Lanka. The vanaras became very happy. They conferred as to how to cross the sea. Finally Jambavan pursuaded Hanuman to undertake the uphill task. Hanuman selected a suitable place on the top of the Mahendra hill and got ready to jump to Lanka.

116138 20.12.4396 Friday	Khrodhi Magha Sukla Chaturdasi 13.97 and Paurnima from 1h.13m. 57 sec.	Aslesha 113.58	Hanuman landed in Lanka in the evening. When the sun had set, Moon set in and shone brightly, to help Hanuman in the search for Sita. But he could not locate her. He got dejected and bowed to the Gods in prayer. Just then he saw a park viz., Ashoka vana where he had not searched earlier. He climbed up and sat hidden among the leaves of a tree, hoping Sita would certainly come to the garden for her sandyavandanam. When he looked under the tree, he saw a lady seated. He took a long look at the face of Sita, as the Moon also in that early morning shone brightly as if on purpose to help him. He then saw Ravana approach her with a retinue. Hidden in the tree, He watched what was going on below When Ravana went away, Hanuman started narrating the story of Sri Rama. When Sita looked at him, he approached her and gave the message of Sri Rama and the signet ring.

116139 21.12.4396 Saturday	Khrodhi Magha Bahula Pratama 15.99	Makha 126.76	Hanuman comforted Sita saying that Sri Rama would soon arrive to annihilate Ravana and his race and regain her. He received choodamani from her. He then commenced to destroy the park so as to catch the attention of Ravana. Ravana sent a few warrior chiefs to capture Hanuman. But Hanuman killed them all. Finally he was bound by the Brahma Astra of Indrajit and was taken before Ravana. Hanuman told Ravana that he was the messenger of Sri Rama and advised him to turn to the path of Dharma. Angered at his words, Ravana ordered his men to set fire to the tail of Hanuman. It was done. Hanuman then set fire to all the buildings in Lanka. He went and saw, Sita. He then took leave of her to return to Sri Rama and jumped back.
116140 22.12.4397 Sunday	Khrodhi Magha Bahula Tritiya 17.01	Purva Phalguna 139.33	Hanuman landed on the Mahendra hill and was welcomed by Jambavan and others with great affection. He conveyed the glad news that he saw Sita

			safe in Ashok vana. They all conferred and decided to rush to Sri Rama and report everything and then do what they were asked to do. En route they entered the protected park and drank honey and fruits.
116141 23.12.4396 Friday	Khrodhi Magha Bahula Chaturti	Uttara Phalguna 153.11	Dhadhimuka, the keeper of the park, hurried to Sugriva and complained. Sugriva understood the position and asked the keeper to send them all to him at once. Dhadhimukha hastened and conveyed to them the king's commands. The vanaras then rushed to the presence of their king and Sri Rama. Hanuman bowed and said 'SEEN HAVE I SITA, THE GODDESS OF PURITY', and handed over the choodamani to Sri Rama. Inspired and cheered by Hanuman, Sri Rama took a snap decision and gave the order to proceed to Lanka, forthwith. Under the star of triumph, Uttara Phalguna, (VI.4.6) at high noon which is the Vijaya muhurtha, they set forward, greeted by good omens.

			NOTE: the Nakshatra Uttara Phalguna given by Valmiki in VI.4.5 tallies with our chart confirming all our calculations correct.
116158 9.1.4395 Monday	Viswavasu Palguna Sukla Sashti 5.3	Bharani 17.11	They reached the Mahendra mountain, on the sea shore (VI.4.101). They all camped in the forest by the sea shore. (VI.5.23)
116159 10.1.4395 Tuesday	Viswavasu Palguna Sukla Saptami 6.31	Krithiga 30.28	Kumbakarana and Vibhishna tendered advice to Ravana to restore Sita to Sri Rama. Realising that he had no place for himself in Lanka there after, Vibhishna rose to the sky and proceeded to the spot where Sri Rama was camping. Vibhishna Spoke from the sky that he wished to surrender to Sri Rama and prayed for protection. After conferring with those present, Sri Rama decided to take Vibhishna in his camp. He promised to make him the King of Lanka and a token Pattabisheka was performed. Suggested by Vibhishna, Sri Rama began a fast with a request to the sea-god for a causeway.

116160 of 11.1.4395 Wednesday	Viswavaha Palguna Sukla Ashtami 7.32	Rohini 43.46	2nd day of fasting.
116161 12.1.4395 Thursday	Viswavaha Palguna Sukla Navami 8.34	Mrigasirsha 56.64	3rd day of fasting
116162 13.1.4395 Friday	Viswavaha Palguna Sukla Dasami 9.36	Ardra 69.81	On the 4th day, as the sea-god did not respond Sri Rama got angry and shot an arrow into the bosom of the sea. The sea-god then apeared before Sri Rama and showed a favourable place for a causeway to be built by Nala, who had the ability to do the job. Sri Rama accepted the offer of help and ordered for the work to begin. All evinced great enthusiasm in the gigantic task. 14 yojanas were covered on the 1st day.
116163 14.1.4395 Saturday	Viswavaha Palguna Sukla Ekadasi 10.37	Punarvasu 82.99	20 yojanas were covered on the 2nd day.

116164 15.1.4395 Sunday	Viswavaha Palguna Sukla Dwadasi 11.39	Pushya 96.16	21 yojanas were covered on the 3rd day.
116165 16.1.4395 Monday	Viswavaha Palguna Sukla Trayodasi 12.41	Aslesha 109.34	22 yojanas were covered on the 4th day.
116166 17.1.4395 Tuesday	Viswavaha Palguna Sukla Chaturdasi 13.42	Makha 122.51	23 yojanas were covered on the 5th day.
116167 18.1.4395 Wednesday	Viswavaha Palguna Sukla Paurnami 14.44 (VI.38.79)	Purva Palguna 135.69	The construction of the causeway was complete. Then they went on the causeway. Hanuman carried Sri Rama on his shoulders and Angada carried Sri Lakshmana on his. They crossed the sea and rested for the night of the Paurnami (VI.38.19) on Mount Suvela. **NOTE: Paurnami titi in our chart tallies with that given by Valmiki in VI.38.19 there by confirming that all our previous calculations are correct.**
116168 19.1.4395 Thursday	Viswavaha Palguna Bahula Pratama 15.46	Uttara Palguna 148.87	In the morning, Sri Rama standing on the mountain top had an aerial survey of Lanka. The army then descend-

			ed from the mount and took positions as ordered by Sri Rama. Sri Rama sent a message through Angada to return Sita or face a war. Ravana did not respond. **BATTLE BEGAN:** It began with a fierce duel between individual warriors for the entire day time. In the night also the battle continued; the Princes were bound by Serpent Darts by Indrajit, but the darts disappeared when Garuda arrived. Vanaras resumed attack with jubiliant acclamations. After losing Dhoomrakshaka,' Vajradanta, Akampana in the night itself Ravana got upset.
116169 20.1.4395 Friday	Viswavaha Palguna Bahula Dwitiya 16.48	Hasta 162.05	Prahasta was then deputed by Ravana to fight and was killed by Neela. Then Ravana himself went to the front. Sri Rama broke his crown and chariot. Seeing Ravana unarmed, Sri Rama asked him to retire from the field and come back again fully armed and prepared. Ravana

			felt humbled. Kumbakarna was then roused from sleep with some efforts. He had gone to sleep nine days before after giving his advice to Ravana along with Vibhishna.
to	to	to	**NOTE: These nine days tally with our chart** Kumbakarna went to the battle field. His head was cut off by an arrow of Sri Rama. Then perhaps on each day the following warrior chiefs were killed by different warriors of Sri Rama. .Narantaka was killed by Angada. Devantaka and Trisira were slain by Hanuman. Mahedara was killed by Neela.
to	to	to	Atikaya fell a prey to Lakshmana's arrow
116174 25.1.4395 Wednesday	Viswavaha Bahula Saptami 21.56	Jeyshta 227.92	Indrajit went to the battle field. He tied up the Princes by Brahma Astra. Sanjeevi hill was brought by Hanuman which made the darts slip away

			and cured the wounds. Vanaras then set fire to the buildings of Lanka that night.
116175 26.1.4395 Thursday	Viswavaha Palguna Bahula Ashtami 22.57	Moola 241.1	Kumba was slain by Sugriva and Nikumba by Hanuman.
116176 27.1.4395 Friday	Viswavaha Palguna Bahula Navami 23.59	Poorva Ashada 254.28	Nakaraksha fell a prey to Sri Rama's arrows, in the night.
116177 28.1.4395 Saturday	Viswavaha Palguna Bahula Dasami 24.6	Uttara Ashada 267.46	At the bidding of Ravana, Indrajit went again to the battlefield and staged a drama of Maya Sita vadha before the vanaras, thereby gaining time to perform the asuric sacrifice. Vibhishna advised Sri Rama to depute Lakshmana at once to mar the purpose of Indrajit. Fierce battle followed between Sri Lakshmana and Indrajit for three days and nights.
116180 31.1.4395 Tuesday	Viswavaha Palguna Bahula Trayodasi 27.65	Sathabishag 306.99	Finally when Sri Lakshmana invoked Sri Rama and shot the Indra Astra to strike Indrajit, it killed Indrajit. Sri Lakshmana went to Sri Rama who gave him a

			warm embrace as a reward for his victory.
116181 1.2.4395 Wednesday	Viswavaha Palguna Bahula Chaturdasi 28.67 (VI.93.65)	Poorva Bhadrapada 320.16	Ravana's grief and anger swelled, when he was told that Indrajit was killed. He went to Ashoka vana to kill Sita. He was stopped by his minister Suparsava. He said that it would be New Moon day next day as it is Krishna Paksha Chaturdasi (VI.93.65) and he could go with renewed vigour to the battle field and achieve victory. Ravana felt that Suprava was right and abandoned the idea of killing Sita. **NOTE: Krishna Chaturdasi tallies with our chart confirming that ours is correct.**
116182 2.2.4395 Thursday to	Viswavaha Palguna Bahula Amavasya 29.68 to	Uttara Bhadrapada Revati to	Ravana went to the battlefield again. Rama-Ravana Yudha was waged with no parallel to it. Ravana was wounded and fell unconscious. His charioteer took him out of the field. When Ravana regained consciousness, he asked the charioteer to take him back to the front. Meanwhile Sage Agastya ininitiated Aditya Hirudayam to Sri Rama

			and Sri Rama chanted the same. Rama-Ravana fight resumed.
116185, 5.2.4395 Sunday	Viswavaha Chaitra Sukla Tritiya 2.73	Kritiga/ Rohini	At the most appropriate moment, Matali reminded Sri Rama about the Brahma Astra. Sri Rama used that Astra. Ravana was killed. On the suggestion of Sri Rama, Vibhishna performed obsequies of Ravana.
116186 6.2.4395 Monday	Viswavaha Chaitra Sukla Chaturti 3.74	Rohini Mrigasirsha	Perhaps on this day after the auspicious bath, Vibhishna was crowned as the King of Lanka. When Sita went to Sri Rama and after the unexpected words from him, she jumped into the burning fire, kindled by Sri Lakshmana at her bidding. Agni, God of fire, emerged from the fire with Sita in his hands and presented her to Sri Rama. Sri Rama accepted her saying, as he drew her to his side, that all this ordeal was for public satisfaction. Then Dasaratha descended from above and blessed them. Indra appeared bestowed his boon and vanaras who died regained their lives.

116187 7.2.4395 Tuesday	Viswavaha Chaitra Sukla Panchami 4.76 (VI.127.1)	Mrigasirsha/ Ardra/ Punarvasu (See Note X.5)	Sri Rama and Sita reunited. They boarded the Pushpaka Vimana with Vibhishna, Vanara chiefs and vanaras and it carried them swiftly by air. As they travelled in the sky, Sri Rama was pointing out to Sita the spots where important events occurred. As desired by Sita they alighted in Kishkinda and collected the woman-folk of vanaras. In the evening they reached the ashram of Bharadwaja. It was Sukla Panchami titi (VI.127.1). As requested by the sage, they all spent the night there. Sri Rama sent word in advance through Hanuman to Guha and Bharata that they would be arriving at Ayodhya next morning. When Hanuman informed Bharata in the night about the arrival of Sri Rama and party the next morning, the city of Ayodhya was filled with joy. Bharata ordered for preparations over night to give a fitting reception to Sri Rama and party. **NOTE: The Panchami titi in our chart tallies with that given by Valmiki in VI 127.1**

116118 8.2.4395 Wednesday	Viswavaha Chaitra Sukla Sashti 5.78	Punarvasu Pushya	Sri Rama and Sita with Sri Lakshmana reached Nandigrama in the morning. They all met their brothers and mothers. Quick arrangements were made for the Coronation. **SRI RAMA WAS CROWNED KING OF AYODHYA,** when the Nakshatra Pushya was ruling and at Vijaya Muhurta, which is a favourite Muhurta of Sri Rama Gods blew their trumpets. Heaps of flowers were showered from the Heavens. Sri Bharata's penance ended and his heart was filled with joy. Receiving a pearl necklace form Sri Rama, Sita presented it to Hanuman, as a token of gratitude to his service. Sri Rama lived happily with Sita and ruled the country for many many ears. This RAMA RAJYA is still spoken as most ideal. Those who read or listen to this diary of Sri Rama will be saved from sin and sorrow and will enjoy all the good things of life.

NOTE X.1

FIXATION OF THE DAY WHEN SURPANAKA CHANCED TO VISIT SRI RAMA'S HERMITAGE

स रामः पर्णशालायामासीनस्सह सीतया ।
विरराज महाबाहुश्चित्रया चन्द्रमा इव ॥

"When long-armed Rama was sitting with Sita in their hermitage, he was shining like the Moon with Chitra star".

Thus Valmiki describes the day on which Surpanaka chanced to visit the hermitage of Sri Rama. This is a most important day, as it was a turning point in Ramayana. At the first reading it may appear that चित्रया चन्द्रमा इव is used as a simple simile to compare Sri Rama to Moon and Sita to Chitra constellation.

But the author felt that there may be something more than this, that Valmiki wants his posterity to understand by this simile, which may be flexible enough for some seekers to trigger new insights and to see more in it than others who do not. So a probe was made to check up whether it could be Chitra Nakshatra ruling on that day, so that it could mean also that as the Moon was shining with Chitra nakshatra on that day, Sri Rama was shining. The probe led to the illumination that, that day did have Chitra as the ruling nakshatra.

The calculation is reproduced hereunder.

Julian Day on the 31st January,	4369 B.C. ..	115815
Julian Day on the 11th February,	4433 BC. ..	102311
Difference in days		13504
Motion of Moon in 13504 days @ 13°.1764 per day		94°.11
Longitude of Moon on the 11th Feb. 4433 B.C...		84°.07
Adding the above		178°.18

The segment of Chitra constellation falls between 173° to 186°.40. So it was Chitra nakshatra ruling on the 31st January 4396 B.C. By this wonderful process of resuming the thread left loose by Valmiki earlier, we find that the missing link buried deep is brought to the surface. This date fits in very well to account for the developments charted by us in Rama's Diary. Three weeks later i.e., on the 20th February, 4396 B.C., the 38th birthday of Sri Rama siderealy, Sita was abducted by Revana.

Thus Valmiki, in his own favourite method of recording hometruths and disseminating vital information in a captivating style, has not let this occasion also pass without bringing in a simile, self illustrative and intimately connected with this important context. Herein he refers to the conjunction of the planet Moon with the constellation Chitra, not only to communicate to his readers the complexional beauty and personal charm of Sri Rama but also the nakshatra ruling on that day.

NOTE X.2

FIXATION OF THE LAST DAY FOR VANARAS TO RETURN AFTER SEARCH FOR SITA

वयमाश्वयुजे मासि कालसंख्याव्यविस्थिताः ।

प्रस्थिताः सोऽपि चातीताः किमतः कार्यमुत्तरम् ॥ V 5322

"Further, we all set out with the time limit as that date when Moon gets to the constellation Aswini in the month. That date is crossed. What to do next?"

Thus Angada spoke to the Vanaras after they came out of the cave of the Tapasvini and when he realised that the time limit fixed by Sugriva had already passed and yet Sita was not located. We have to understand from the words **आश्वयुजे मासि कालसंख्याव्यवस्थिताः** that the last date fixed by Sugriva was when the Moon reached the constellation Aswini in the month. This means that it was the day when Aswini nakshatra ocurred in the month.

Let us now calculate the day when Aswini nakshatra occurred in the month.

Julian Day on the 12th December, 4396 B.C.	.. 116130
Julian Day on the 11th February, 4433 B.C.	.. 102311
Difference	.. 13819
Motion of Moon in 13819 days at 13°.1764 per day...	284°.09
Longitude of Moon on the 11th Feb. 4433 B.C.	84°.07
Adding	8°.16

The segment of Aswini is 0°.00 to 13°.33.

So the constellation Aswini occurred on the 12th December, 4369 B.C.

NOTE X-3

FIXATION OF THE DAY ON WHICH SITA WAS CARRIED AWAY.

वर्तते दशमो मासो द्वौ तु शेषौ प्लवङ्गम ।
रावणेन नृशंसेन समयोः यः कृतो मम ॥ IV. 37.8

"O Vanara! Ten months out of twelve-months term allotted to me by the wicked Ravana have rolled away with two more months remaining".

Thus spoke Sita to Hanuman when they met at Ashok Vana on the 20th December, 4369 B.C., the Julian Day being 116138. This happened ten months after she was carried away by Ravana. It is evident that on the 20th February, 4396 B.C., she was carried away. This date tallies well with our chart. It is interesting to note that the day on which Sita was carried away, happens to be the 38th birth day of Sri Rama.

Further three weeks earlier, On the 31st January, 4396 B.C. Surpanaka chanced to meet Sri Rama at his hermitage.

This gives a good word-picture of the days taken for the subsequent developments since she met Sri Rama.

NOTE X-4

FIXATION OF THE DAY ON WHICH ANGADA DEPUTED VANARAS TO SEARCH FOR SITA

In IV.0.69 Angada orders the vanaras to return before a month expires in search of Sita. "MAASE POORNE NIVARTADHWAM" As we discussed earlier, the last day to return after the search for Sita was the day when Aswini constellation was ruling i.e., Thursday, the 12th December, 4396 B.C. If we deduct one month we get Saturday, the 12th November, 4396 B.C.

Thus the day on which Angada deputed the vanaras to search for Sita gets fixed.

NOTE X-5

FIXATION OF NAKSHATRA ON THE DAY ON WHICH SRI RAMA COMPLETED HIS EXILE

In II.15.3, Valmiki has given directly the star as Pushya on the day of Sri Rama's departure on exile. The titi, Chaitra Sukla Dasami had set in when he actually left Ayodhya by noon. He went on exile the next day of his 25th birthday. We have also seen that it was Sunday, the 16th February, 4409 B.C.

In VI.127.1, Valmiki has said that on his way back to Ayodhya, Sri Rama and party reached Bharadwaja Ashram on the day when Sukla Panchami titi was ruling. This titi tallies well with our chart, thereby confirming that all our computations are correct. It was Tuesday, the 7th February, 4395 B.C.

By the phrase 'Poorne chaturdase varshe' in VI.127.1, Valmiki has declared that fourteen years of exile got technically completed on the day when he reached Bharadwaja Ashram on the return journey. In VI.128.24, Bharadwaja requested Sri Rama to spend that night in his ashram and proceed to Ayodhya next day. In VI.129.56, Hanuman clarifies that on the next day the Nakshatra Pushya would be ruling, when he was speaking to Bharata on 7.2.4395 B.C. This makes it very clear that Punarvasu was ruling on the day Sri Rama reached Bharadwaja ashram. Recalling, Sri Rama went on exile on a Chaitra Pushya star and completed it on a Chaitra Punarvasu star after full fourteen years, reckoned by nakshatra. Sri Rama went on exile on Sukla Dasami titi and completed fourteen years on Sukla Panchami titi. By this Valmiki has conveyed to his posterity that sidereal system was being practised during that age for reckoning the civilian periods, though titis were being followed for Punya Kalams, Rituals, Ceremonies etc. This is an important factor for us when we wish to fix the days of important events.

Valmiki has given the titis and nakshatras of various events, in his text in a punctuated pattern. We have seen that so far all these are tallying very well with our calculations. Such coincidences are highlighted in our chart at every instance. Wherever Valmiki has indicated the titis and nakshatras indirectly, the author has discussed them and given a separate note at the end of the Chapter. They all

tally. This confirms that the method adopted by the author in fixing the titis and nakshatras are correct, as so far proved. The method is very simple. It is by the rule of three. The Birth Day of Sri Rama, Sunday, the 11th February, 4433 B.C., (Julian Day 102311) is treated as the key day or reference day for calculating the titis and nakshatras, since it is a confirmed date in all respects and is closest to the events in Ramayana. But in these, the corrections required due to solar and lunar anomalies are not taken into account. Though all our calculations have so far tallied, they may not in a few cases. One such instance is the nakshatra and not the titi on the day when Sri Rama reached Bharadwaja Ashram on the completion of his exile. As per our calculations the nakshatra is Mrigasirsha. But it should be Punarvasu.

Here one fact has to be recollected. Sri Rama is born in karkataka lagna when Punarvasu was ruling. On the same day, Sri Bharata is born in Meena Lagna when Pushya was ruling. Next day Sri Lakshmana and Sri Satrugna were born in the same karkataka lagna as Sri Rama, when Ashlesha was ruling. Thus within 26 hours, three Nakshatras were ruling, Pushya sandwiched between Punarvasu and Aslesha.

Punarvasu- Kataka Rasi	Pushya Sunrise	Aslesha- Kataka Rasi
← 10.48 A.M.	25 hrs, 12 min	→ 12 Noon next day

Occurrence of three titis in a day is indicated in Valmiki Ramayana. In fact Dasaratha commenced his Putrakameshti on that auspicious day when three titis were ruling.

ततः काले बहुतिथे कस्मिश्चित् सुमानोहरे ।
वसन्ते समनुप्राप्ते राज्ञो यष्ढं मनोऽभवत् ॥ I. 12.1

"Just after the setting in of the lovely vasanta season on a day ruled by many titis, the king got the idea of performing yagna".

Here the mention of the word बहुतिथे 'BAHUTITHE' should mean three titis. Occurrence of more than three titis in a day is not conceivable. Even three titis coming on the same day is very rare. This could occur between sunrises or with one sunrise in between. Such a day appears to have been considered as most auspicious for religious purposes, rituals etc.

The most important day in Valmiki Ramayana is the day on which Sri Rama has taken his Avatara, to kill devilish Ravana. On this day three nakshatras were ruling to underline the divine aspects. Another important day in Ramayana is the day on which Sri Rama completed his exile period and returned to Ayodhya after fulfilling the purpose of his Avatar. Valmiki has stated that it was punarvasu when he reached Bharadwaja Ashram and Pushya next day when he returned to Ayodhya. Thus Punarvasu is sandwiched between Mrigasirsha and Pushya, between 6 A.M. and 11 A.M. next day.

Mrigasirsha-Sunrise	Punarvasu	Pushya-Sunrise
6 A.M.		11 A.M. next day (Maximum)

As per our calculations it was Mrigasirsha when Sri Rama reached Bharadwaja Ashram. So we have to correct the nakshatra on that day as Mrigasirsha/Punarvasu.

Thus when Sri Rama returned to Ayodhya next morning, Wednesday, the 8th February, 4395 B.C., Pushya should have set in before noon, as per the words of Hanuman.

AT NOON, ON WEDNESDAY, THE 8TH FEBRUARY, 4395 B.C., IN PUSHYA NAKSHATRA AND IN VIJAYA MUGURTA, WHICH IS THE FAVOURITE MUGURTA OF SRI RAMA, THE PATTABISHEKA OF SRI RAMA WAS CELEBRATED IN A FITTING MANNER.

Subham.

DATE-WAR EVENTS IN VALMIKI RAMAYANA

Sri Rama's Birth	.. 11th February, 4433 B.C.
Sri Rama's sudden departure with Sage Viswamitra	.. 6.2.4421 B.C.
Sri Rama's Wedding	.. 4.3.4421 B.C.
Sri Rama's stay in Ayodhya after his marriage	.. 5.3.4421 to 16.2.4409 B.C.
Sri Rama's sudden departure on exile	.. 16.2.4409 B.C.
Sri Rama's stay at Chitrakuta	.. 22.2.4409 to 22.3.4409 B.C.
Sri Rama's stay in the company of the rishis by rotation till the end of the 10th year	.. 26.3.4409 to 23.2.4399 B.C.
Sri Rama's stay at Panchavati	.. 26.2.4399 to 20.2.4396 B.C.
From Ravana's abduction of Sita till the day Sugriva sent Vanaras in search for her	.. 20.2.4396 to 12.11.4396 B.C.
Last day fixed for the search of Sita and return,	. 12.12.4396 B.C.
Hanuman's visit to Lanka and return	.. 19.12. to 22.12.4396 B.C.
Sri Rama's sudden departure to Lanka with army of vanaras	.. 23.12.4396 B.C.
March time till Sri Rama reached the sea shore	.. 23.12.4396 to 9.1.4395 B.C.
Darbasayana of Sri Rama	.. 10.1. to 13.1.4395 B.C.
Construction of causeway	.. 13.1. to 18.1.4395 B.C.
Rama-Ravana battle	.. 19.1.4395 to 5.2.4395 B.C
Vibhishna Pattabisheka	.. 6.2.4395 B.C.
Sri Rama's arrival at Bharadwaja ashram	.. 7.2.4395 B.C.
Sri Rama's return to Ayodhya and Pattabisheka	.. 8.2.4395 B.C.

ANNEXURES

ANNEXURE 1

PERT CHART OF ASHWAMEDHI AND PUTRAKAMESHTI YAGNAS OF DASARATHA AND JANANAS OF SRI RAMA AND BROTHERS.

Julian Day	Days	Code	Activities
101942	½	0 – 1	On an auspicious date after the commencement of Vasanta Ruthu, Dasaratha requests Sage Vasishta, Preceptor of Ikshvaku family to conduct the yagnas.
	½	1 – 2	Vashishta gives detailed instructions to all organisers and skilled personnel.
101943	28	2 – 3	Arrangements and preparations are in full swing.
	¼	3 – 4	Arrangements get completed.
	¼	4 – 5	Sacrifice Horse arrives at site.
	¼	5 – 6	Vasishta advises Dasaratha to proceed to Yagnasala.
101972	½	6 – 7	Dasaratha proceeds to Yagnasala.
	b	7 – 8	Yagna commences and preliminary ceremonies.
101972 + b	1	8 – 9	Queen Kausalya kills Sacrifice Horse and stays with it for a night.
	3	9 – 10	Ashwameda Yagna proper.
101975	1	10 – 11	Presentation of gifts to Brahmins and others.
	c	11 – 12	Putrakameshti commences.
101976 + b + c	¼	12 – 13	Prajapati Nara appears at the Agni Kunda and hands over direct to Dasaratha the Divine Payasam.

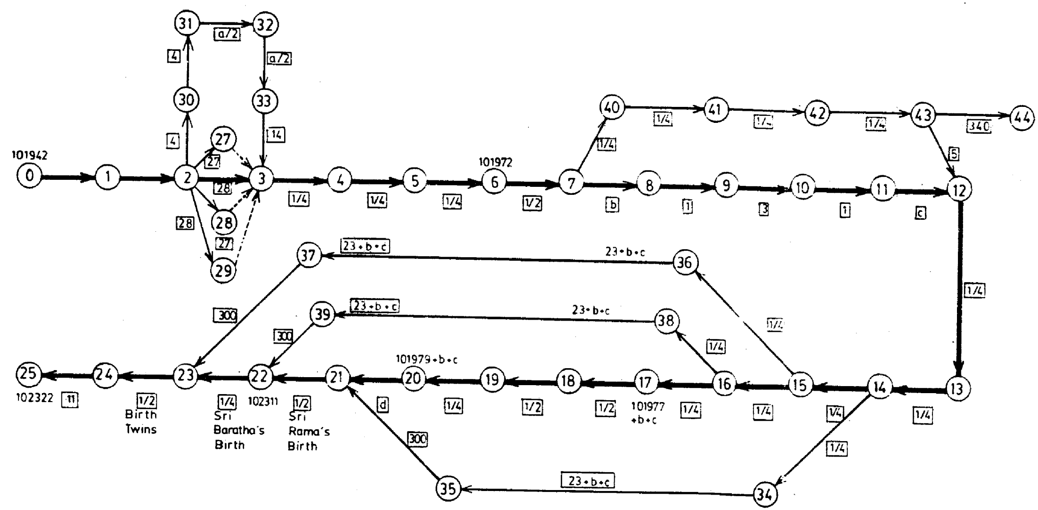
Julian Day	Days	Code	Activities
	¼	13 – 14	Dasaratha himself gives 50% of Payasam to Queen Kausalya first separately.
	¼	14 – 15	Dasaratha himself gives half of the balance ie., (25%) of the Payasam to Queen Sumatra separately.
	¼	15 – 16	Dasaratha himself gives half of the balance i.e., (12½%) of the Payasam to Queen Kaikeyi separately.
101977 + b + c	¼	16 – 17	Dasaratha himself gives the entire balance of 12½% payasam to Queen Sumatra again separately.
	½	17 – 18	Dasaratha gives ceremonious send off to VVIPs. VIPs and other guests after rewarding them with suitable gifts.
101978 + b + c	½	18 – 19	Dasaratha returns to Ayodhya.
	¼	19 – 20	Dasaratha rejoices when he comes to know about the pregnancy of the queens.
101979 + b + c	d	20 – 21	Dasaratha awaits the happy births of children.
102311 + b + c + d	¼	21 – 22	Kausalya gives birth to Sri Rama.
	¼	22-23	Kaikeyi gives birth to Sri Baratha.
102312 + b + c + d	½	23 – 24	Sumatra gives birth to Sri Lakshmana and Sri Satrugna
102322 + b + c + d	11	24 – 25	Vasishta performs Namakarana function of all children and Dasaratha lives happily awaiting further happy events.

Julian Day	Days	Code	Activities
101942	27	2 – 27	Workers of various disciplines collect materials required for the yagna and transport them to site.
	27	2 – 28	Workers collect bricks and transport them to site.
	28	2 – 29	As per instructions of Vasishta Sumantra deputes special emissaries to invite VIPs in various places of the kingdom and all the VIPs arrive
101946	4	2 – 30	Sumantra himself goes to Mithula to invite Janaka.
101950	4	30 – 31	Sumantra himself escorts Janaka to Ayodhya.
	a/2	31 – 32	Sumantra himself goes to invite Kasyapa Raja.
	a/2	32 – 33	Sumantra himself escorts Kasyapa Raja to Ayodhya.
	14	33 – 3	Sumandra himself goes to Kekaya to invite the king and escorts him to Ayodhya.
	¼	14 – 34	Queen Kausalya takes her share of payasam.
	23 + b + c	34 – 35	Kausalya conceives soon.
	300	35 – 21	Kausalya develops full pregnancy and attains labour pains.

Julian Day	Days	Code	Activities
	¼	15 – 36	Sumatra takes her share of Payasam.
	23 + b + c	36 – 37	Sumatra conceives soon.
	300	37 – 23	Sumatra develops full pregnancy and attains labour pains.
	¼	16 – 38	Kaikeyi takes her share of Payasam.
	23 + b + c	38 – 39	Kaikeyi conceives soon.
	300	39 – 22	Kaikeyi develops full pregnancy and attains labour pains.
	¼	7 – 40	Devas, Suras, Gandharvas etc., witness yagna of Dasaratha and confer.
	¼	40 – 41	They all proceed to Brahma and represent their grievances regarding the atrocities of Ravana.
	¼	41 – 42	Appearance of Vishnu.
	¼	42 – 43	Lord Vishnu listens to their grievances and proclaims his intention to take Avatar as Sri Rama to annihilate Ravana and his race.
	5	43 – 12	Brahma deputes his Nara to appear at the Agni Kunda and hand over the Divine Payasam to Dasaratha.
	340	43 – 44	Brahma advises Devatas to produce powerful vanara heroes through the vanara womenfolk.

ANNEXURE-2

PERT CHART OF ASWAMEDHI AND PUTRAKAMESHTI YAGNAS OF DASARATHA AND JANANAS OF SRI RAMA AND BROTHERS



LEGEND

- Critical path
- Figures with in box Indicate Maximum allowable period in days
- 102311 Six digit figures Indicate the Julian day

ANNEXURE 4.

Days from 1st January to the end of the Year

Ordinary year	Date	Days	Ordinary year	Date	Days
January	1	1	February	1	32
	2	2		2	33
	3	3		3	34
	4	4		4	35
	5	5		5	36
	6	6		6	37
	7	7		7	38
	8	8		8	39
	9	9		9	40
	10	10		10	41
	11	11		11	42
	12	12		12	43
	13	13		13	44
	14	14		14	45
	15	15		15	46
	16	16		16	47
	17	17		17	48
	18	18		18	49
	19	19		19	50
	20	20		20	51
	21	21		21	52
	22	22		22	53
	23	23		23	54
	24	24		24	55
	25	25		25	56
	26	26		26	57
	27	27		27	58
	28	28		28	59
	29	29			
	30	30			
	31	31			

March	1	60
	2	61
	3	62
	4	63
	5	64
	6	65
	7	66
	8	67
	9	68
	10	69
	11	70
	12	71
	13	72
	14	73
	15	74
	16	75
	17	76
	18	77
	19	78
	20	79
	21	80
	22	81
	23	82
	24	83
	25	84
	26	85
	27	86
	28	87
	29	88
	30	89
	31	90
April	1	91
	2	92
	3	93
	4	94
	5	95
	6	96
	7	97
	8	98
	9	99
	10	100
	11	101
	12	102
	13	103
	14	104
	15	105
	16	106
	17	107
	18	108
	19	109
	20	110
	21	111
	22	112
	23	113
	24	114
	25	115
	26	116
	27	117
	28	118
	29	119
	30	120
May	1	121
	2	122
	3	123
	4	124
	5	125
	6	126
	7	127
	8	128
	9	129
	10	130
	11	131
	12	132
	13	133
	14	134
	15	135

	16	136
	17	137
	18	138
	19	139
	20	140
	21	141
	22	142
	23	143
	24	144
	25	145
	26	146
	27	147
	28	148
	29	149
	30	150
	31	151
June	1	152
	2	153
	3	154
	4	155
	5	156
	6	157
	7	158
	8	159
	9	160
	10	161
	11	162
	12	163
	13	164
	14	165
	15	166
	16	167
	17	168
	18	169
	19	170
	20	171
	21	172
	22	173
	23	174
	24	175
	25	176
	26	177
	27	178
	28	179
	29	180
	30	181
Julv	1	182
	2	183
	3	184
	4	185
	5	186
	6	187
	7	188
	8	189
	9	190
	10	191
	11	192
	12	193
	13	194
	14	195
	15	196
	16	197
	17	198
	18	199
	19	200
	20	201
	21	202
	22	203
	23	204
	24	205
	25	206
	26	207
	27	208
	28	209
	29	210
	30	211
	31	212

August	1	213	September	9	252
	2	214		10	253
	3	215		11	254
	4	216		12	255
	5	217		13	256
	6	218		14	257
	7	219		15	258
	8	220		16	259
	9	221		17	260
	10	222		18	261
	11	223		19	262
	12	224		20	263
	13	225		21	264
	14	226		22	265
	15	227		23	266
	16	228		24	267
	17	229		25	268
	18	230		26	269
	19	231		27	270
	20	232		28	271
	21	233		29	272
	22	234		30	273
	23	235	October	1	274
	24	236		2	275
	25	237		3	276
	26	238		4	277
	27	239		5	278
	28	240		6	279
	29	241		7	280
	30	242		8	281
	31	243		9	282
September	1	244		10	283
	2	245		11	284
	3	246		12	285
	4	247		13	286
	5	248		14	287
	6	249		15	288
	7	250		16	289
	8	251		17	290

	18	291
	19	292
	20	293
	21	294
	22	295
	23	296
	24	297
	25	298
	26	299
	27	300
	28	301
	29	302
	30	303
	31	304
November	1	305
	2	306
	3	307
	4	308
	5	309
	6	310
	7	311
	8	312
	9	313
	10	314
	11	315
	12	316
	13	317
	14	318
	15	319
	16	320
	17	321
	18	322
	19	323
	20	324
	21	325
	22	326
	23	327
	24	328
	25	329
	26	330
	27	331
	28	332
	29	333
	30	334
December	1	335
	2	336
	3	337
	4	338
	5	339
	6	340
	7	341
	8	342
	9	343
	10	344
	11	345
	12	346
	13	347
	14	348
	15	349
	16	350
	17	351
	18	352
	19	353
	20	354
	21	355
	22	356
	23	357
	24	358
	25	359
	26	360
	27	361
	28	362
	29	363
	30	364
	31	365

ANNEXURE 5

NAKSHATRAS, THEIR OTHER EQUIVALENTS AND DEGREES:

No.	English	Tamil	Sanskrit	Deg. up to ° '
1.	Beta Arietis	Aswini	Aswini	13 20
2.	35 Arietis	Bharani	Bharani	26 40
3.	Eta Tauri	Kirutikai	Kritika	40 00
4.	Aldebaran	Rohini	Rohini	53 20
5.	Lambda Orionis	Mrigasirsham	Mrigasirsha	66 40
6.	Alpha Orionis	Tiruvadirai	Ardra	80 00
7.	Beta Geminoram	Punarpusam	Punarvasu	93 20
8.	Delta Cacri	Pusam	Pushya	106 40
9.	Alpha Hydroe	Ayilyam	Ashlesha	120 00
10.	Regulus	Magam	Makha	133 20
11.	Delta Leonis	Pooram	Purva Phalguni	146 40
12.	Beta Leonis	Uttiram	Utara Phalguni	160 00
13.	Delta Gorvi	Astham	Hasta	173 20
14.	Spica Virgins	Chitirai	Chitra	186 40
15.	Arcturus	Suwathi	Swati	200 00
16.	Alpha Libroe	Visakam	Vishaka	213 20
17.	Delta Scorpio	Anusham	Anuradha	226 40
18.	Antares	Kettai	Jyeshta	240 00
19.	Lambda Scorpii	Moolam	Mula	253 20
20.	Delta Sagittari	Pooradam	Purva Ashada	266 40
21.	Sigma Sagittari	Uthiradam	Uttara Ashada	280 00
22.	Alpha Aquiloe	Thiruvonam	Shravana	293 20
23.	Beta Delphinum	Avittam	Dhanishta	306 40
24.	Lambda Acquarius	Sadayam	Satha Bishag	320 00
25.	Alpha Pegasi	Pooratati	Purva Bhadrapada	333 20
26.	Gama Pegasi	Uthiratati	Uttara Bhadrapada	346 40
27.	Zeta Piscum	Revati	Revati	360 00

THE ZODIAC AND THE PLANETS

Below are given the names of the twelve signs both in the Indian and Western systems and their symbols.

Table of Signs

Indian System	Western System	Symbol
Mesha	Aries	♈
Vrishabha	Taurus	♉
Mithuna	Gemeni	♊
Kataka	Cancer	♋
Simha	Leo	♌
Kanya	Virgo	♍
Tula	Libra	♎
Vrischika	Scorpio	♏
Dhanu	Sagittarius	♐
Makar	Capricorn	♑
Kumbha	Acquarms	♒
Meena	Pisces	♓

The Zodiac is diagrammatically represented in the following manner in the Indian and Western systems. We have chosen the most convenient forms only.

Diagrammatic Representation

12 MEENA	1 MESHA	2 VRISHABHA	3 MITHUNA
11 KUMBHA	INDIAN SYSTEM		4 KATAKA
10 MAKAR			5 SIMHA
9 DHANU	8 VRISCHIKA	7 THULA	6 KANYA